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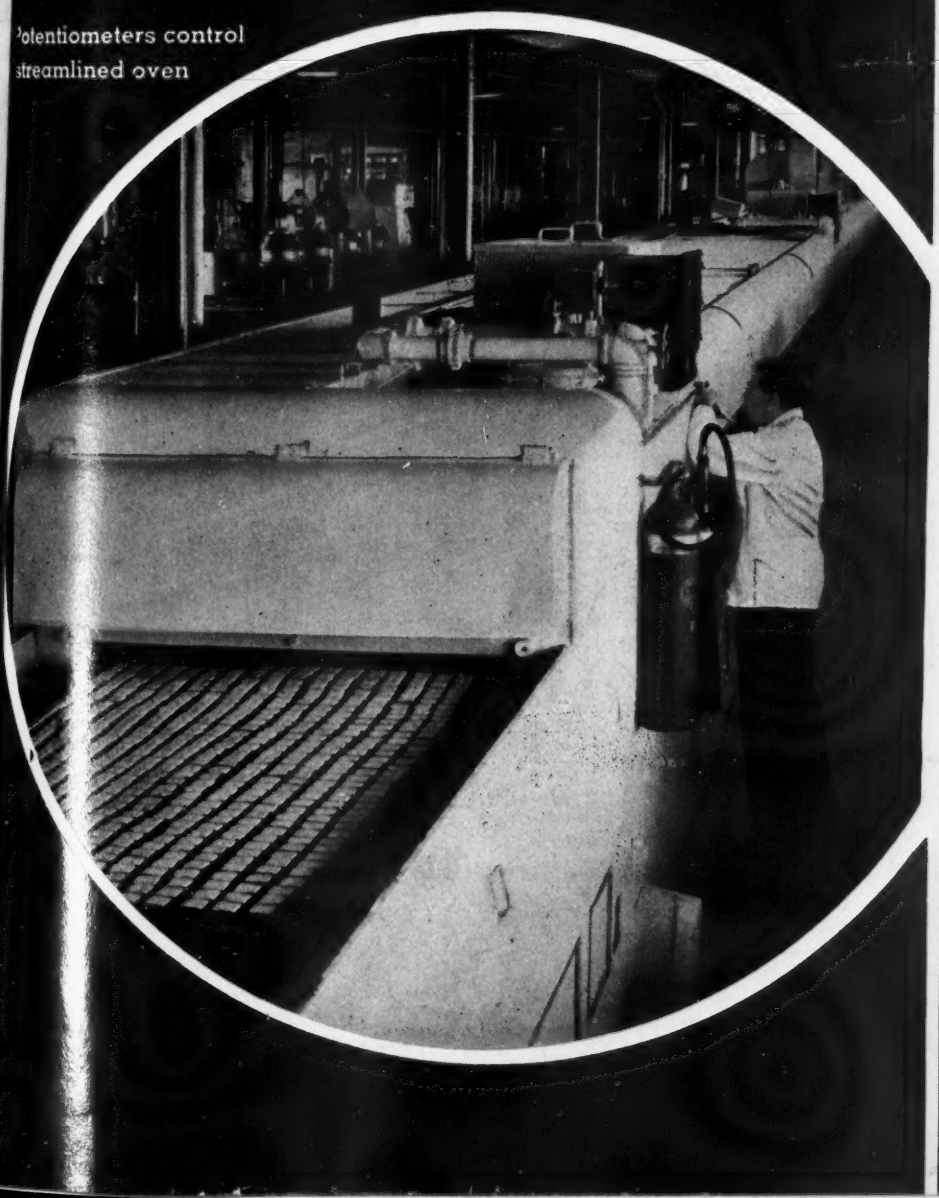

Potentiometers control streamlined oven

DECEMBER 1947

Mobile Freezer For Short Season Areas

Impact Method Of Flour Milling

Using Aluminum Cans in Norway

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Many Uses Seen For New Stabilizer

Brew Masters, Dairy Industry Meetings

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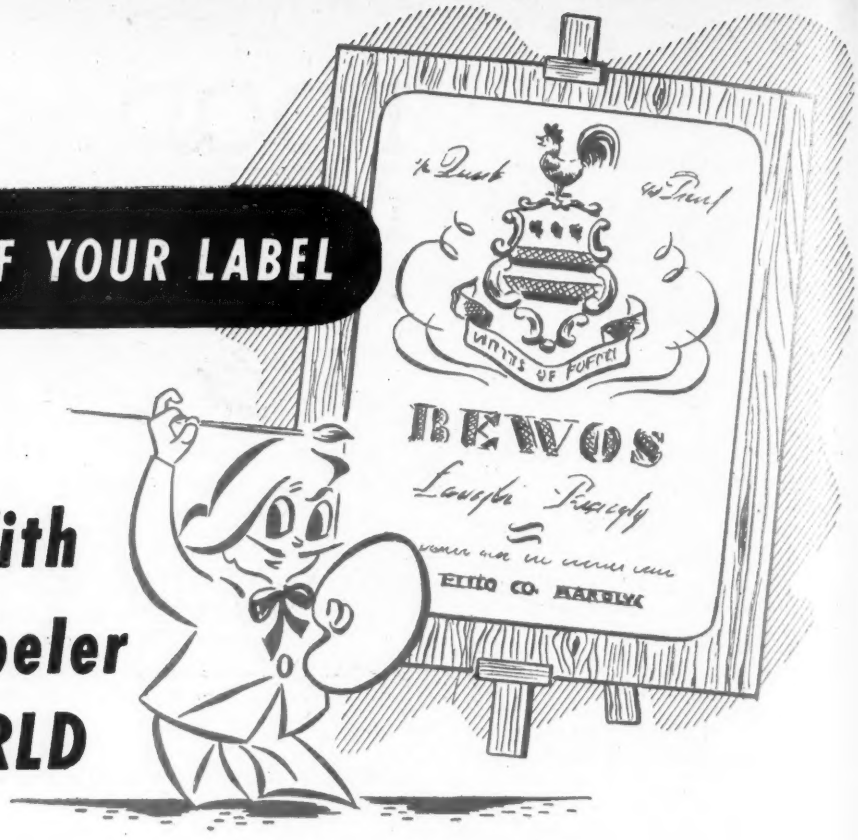

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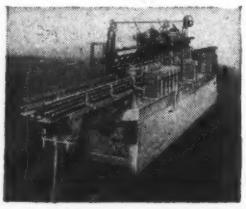

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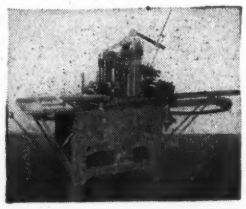

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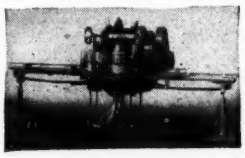

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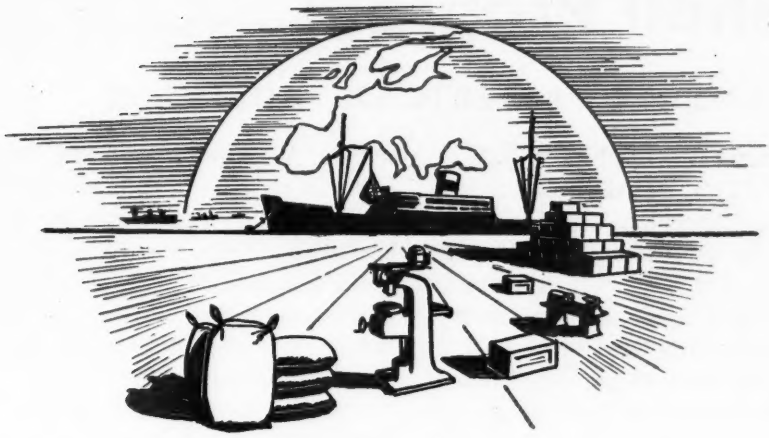

The Marshall Program

WHAT WILL THE MARSHALL PROGRAM mean to American business? What industries will be called upon to meet the needs, and how great are they likely to be? Will the program carry with it another dose of inflation? Are new bottlenecks being created, or will old ones gain a new lease on life? Where are materiai shortages likely to fall most heavily?

These and a hundred other questions are in the minds of many American businessmen today. Unfortunately, no final or precise answer can be given to some of them. And it is in the nature of the problem which the Marshall program tackles – that of getting Western Europe on a steady economic foundation – that no precise answers are going to be possible. We have only to view the bad breaks Europe has collected since V-J Day, including the blizzards and drought of this past year, to see how the economic picture can change on short notice.

Nonetheless, the broad dimensions of a Marshall program are sufficiently clear to permit more than a guess about its impact on American business. Both here and abroad committees have been busy for months shaping up Western Europe's rehabilitation needs. At the same time a mine of information has been pulled together about our own output and capacity. The result is a small library of technical reports which carry most of the facts Congress needs for a decision on the immediate problem.

McGraw-Hill's Department of Economics has waded through these reports and queried industry itself to determine the likely effect of the Marshall program on American business. This report carries the main results of their investigation.

One conclusion emerges clear-cut. American business can not provide the assistance Western Europe will need without considerable cost to itself. Such costs are outweighed by the gains that can be expected, economic and social, as well as political. Nevertheless, business will want to anticipate those difficulties that might arise and move to overcome them. The following pages, therefore, highlight both the problems and the benefits that are likely to fall to American business as a result of the Marshall program.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★

The Marshall Program

WHAT IT MEANS TO AMERICAN BUSINESS

WESTERN EUROPE'S INDUSTRIAL MACHINE has picked up considerable speed since V-J Day. But vital gears are not meshing and industry isn't getting the job done that is necessary. The things people most need are those that are lacking. Food output is down more than a fourth. Coal production is lower by a fifth. The net result is a living standard that ranges from bare subsistence in some countries to a level far short of prewar in others. And even this depends on imports for which the area can't pay.

This melancholy economic picture has its political counterpart. The best organized and the most energetic political party in France and Italy is Communist. While the Communists in Germany and Austria are less strong, they still are an element to be reckoned with. These are all key areas which, should they fall within the orbit of an unfriendly power, could well destroy the freedom of political action throughout all of Western Europe.

Needless to say, such a development would have military implications of the utmost importance. It is a military axiom that any defense must be organized in depth. And in the event of any emergency "depth" for the United States must now include Western Europe.

It is this complex mixture of the economic, political, and military, then, that has led to the Marshall program. Underlying this program is a deep conviction: That Western Europe possesses the skills and resources necessary to work out its own economic salvation. The fact that in two years it has not done so reflects both the depth of the wounds it suffered in war and the bad breaks it has received since then. With time these skills and resources can reassert themselves. Meanwhile, food, equipment, and materials from America will shorten the job and enable Western Europe to stay on its feet.

Western Europe's Program

SECRETARY MARSHALL gave the program that bears his name its initial push. But it is Western Europe which quickly seized the initiative. A committee of 16 nations met and surveyed their needs and resources. From this survey grew a broad program designed to achieve a balance between the economies of Western Europe and the rest of the world by 1952. Moreover, the program seeks such a balance while raising the standard of living close to that of pre-war days. Hunger and disorder which force extreme social change might thus be eliminated.

As developed thus far Western Europe's economic program is not a detailed plan of action. It does, however, lay out the terrain that must be covered if its objectives are to be reached. Four fields are staked out for action. One involves an immense effort on the part of the cooperating nations to raise their own capacity and output. A second requires the establishment of internal financial stability in countries like France and Italy that now lack it. A third looks forward to closer economic cooperation between the participating countries on a more permanent basis. Finally, a fourth lays out the extent and nature of the aid which Western Europe will require from the United States and the rest of the Western Hemisphere.

It is this fourth aspect of Western Europe's program that is of primary concern to us here. Nevertheless, the hard core of the Marshall Plan is that aid alone can not solve Europe's problem. And it is no exaggeration to say that the most important features of any program are those which Europe itself must fulfill. In this regard, nothing is more critical than the goals set for an expanded capacity and production.

THE PRODUCTION GOALS

Europe's production goals also have an importance for American business. They suggest lines in which Europe eventually will become independent of the United States, as well as competitive in world markets. Here are some of their highlights:

a) An increase of steel ingot production to 61 million tons, a fifth higher than 1938.
b) Development of oil refining capacity to 2½ times pre-war (largely for refining imported crude).
c) Increase of coal output to 644 million tons (U.S. output in 1947 is around 600 million tons).
d) Rapid advance in the output of electrical products —needed in part to help equip a 25 million kw expansion of generating capacity.
e) A large increase in capacity of other key equipment industries; e.g., mine equipment, petroleum equipment, farm machinery, construction equipment.
f) Restoration of pre-war output of bread grains and cereals; expansion in sugar, potatoes, fats and oils.
g) Restoration of merchant fleets to pre-war size.

These are very ambitious goals. They call for a great advance from the current position, as the chart on the next text page shows. In some aspects (electricity, foodstuffs, perhaps coal, are examples) they appear unlikely to be met, at least by 1952. Such a development would, of course, modify the import list.

THE IMPORT REQUIREMENTS

To do the job that confronts it Western Europe has said it needs more than $20.5 billion of goods and services from this country over a period of four years. In return it would plan to offer us goods and services to the value of $4.7 billion. That leaves a whopping deficit of about $16 billion. The heaviest commodity export ($6 billion) – and the biggest chunk of the deficit – would arise next year. Thereafter, exports would fall off about

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Coal: KEY TO RECOVERY

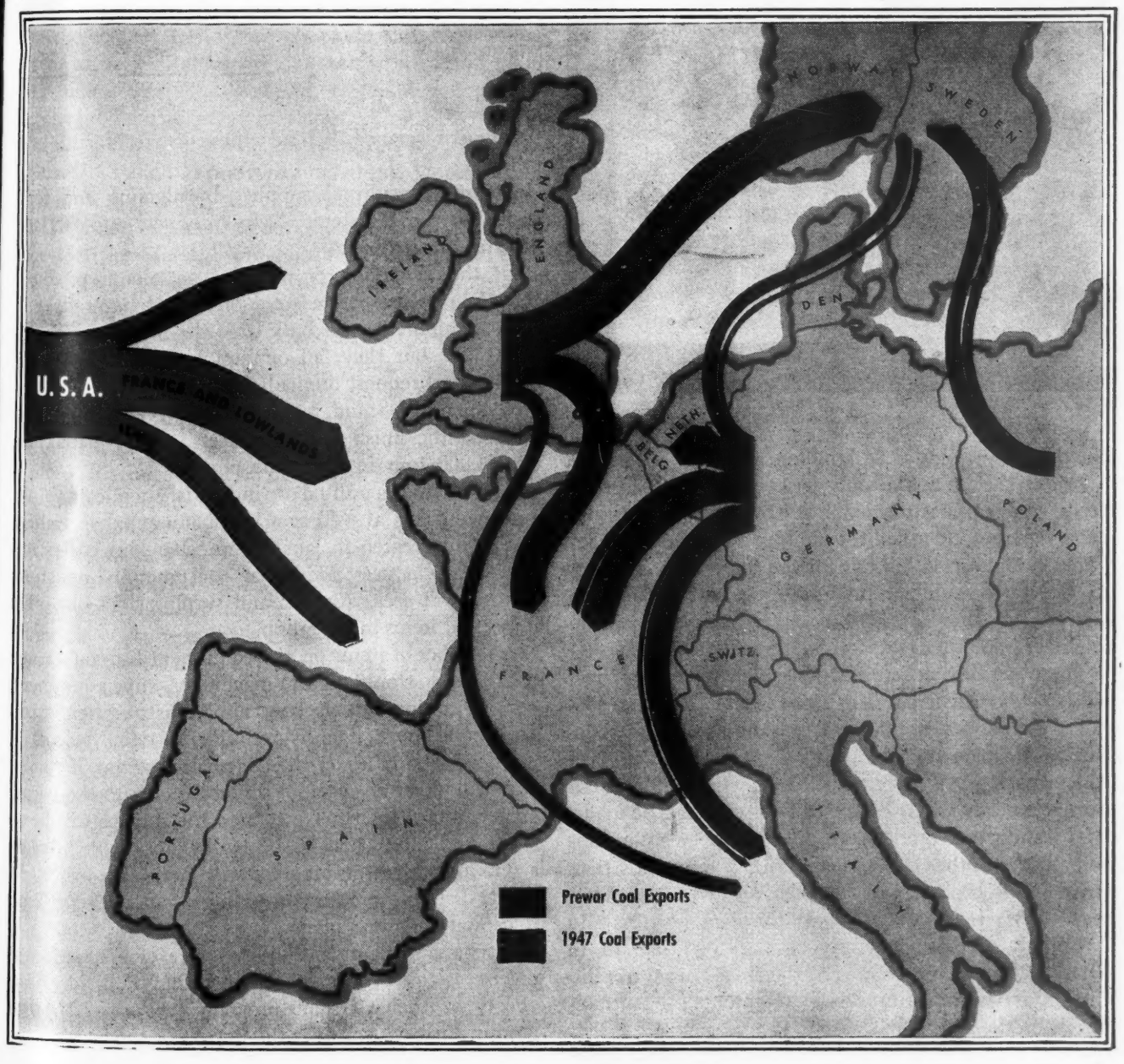
COAL IS AT THE HEART of what is wrong with European industry today. Because of the lack of coal, factories run part time, fields are less fertile, and firesides are cold.

What Western Europe plans to do about coal is typical of what it plans to do about industry generally. The job is to expand output in its own producing centers, resume exports within the region, and cut down costly and unnecessary imports from the United States.

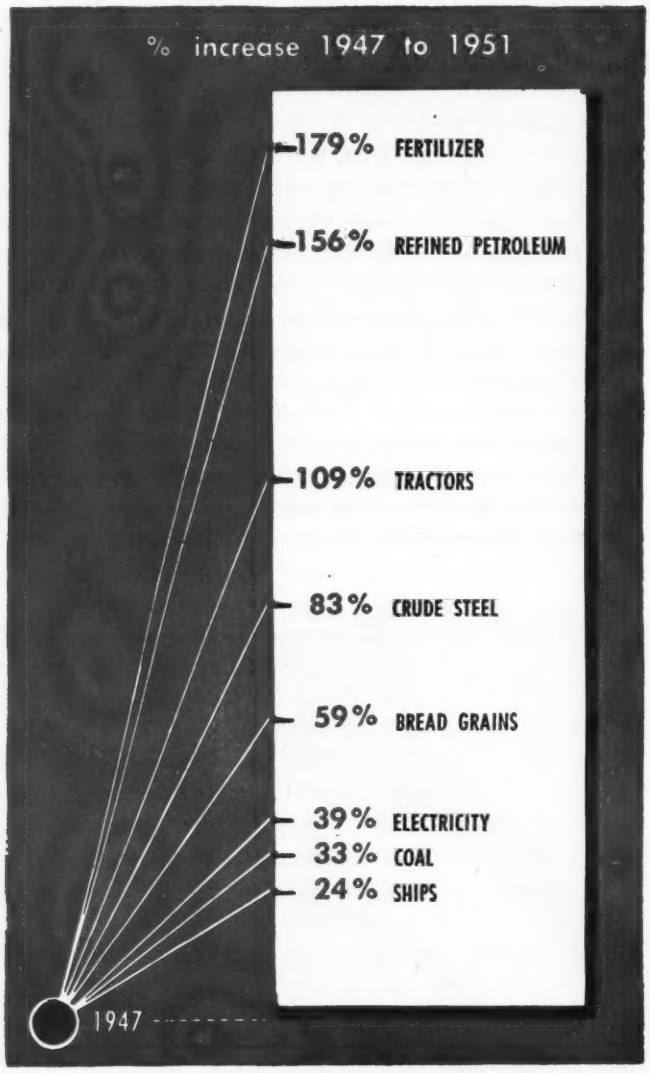
In the case of coal this means restoring a flow which in pre-war days was the life-blood of Europe's industry. As the map shows, two great coal centers – Britain and Germany – supplied not only their own nationals but the needs of other countries as well. Today Britain can't meet its own requirements and coal production in the Ruhr is but half of what it was. The result is the costly necessity to haul coal from the United States.

Western Europe will need 45.2 million short tons of U.S. coal next year. Meanwhile, it plans to build up its own production. By 1951 it hopes to turn out coal at more than the pre-war rate, with Britain and the Ruhr sending sizeable shipments to their neighbors. Coal from the U.S. will have been cut to 6.6 million tons.

Two developments are vital. First, Western Europe must reequip its mines. This calls for a vast production effort on its own part, as well as the import of specialized equipment from the U.S. Second, a river of coal, 34.2 million tons in 1951, must breach the iron curtain and flow from Poland to the West.



Western Europe's Production Goals



one-third to a total of $4.1 billion in 1951.

Nor is the U. S. the only base from which Europe needs vital supplies for which it can't pay. Canada and Latin America are asked to shoulder a trade deficit that comes to almost $6 billions for the four years. Needless to say, if food and raw materials are not available on credit from these areas, the larger will be the sum required from the U. S.

There already is considerable debate about these figures. There will be a lot more while Congress considers the aid program. The fact is, and this is the conclusion at which the President's Committee on Foreign Aid arrived, no final estimate of how much Western Europe's needs might cost over four years can be made. Crops, industrial production, prices, trade relationships and a host of other factors may turn out differently than anyone now expects. For this reason the United States may choose to review Western Europe's progress and its import needs on a yearly basis, rather than fix in detail a four year program. For the same reason our discussion of Western Europe's requirements concentrates largely on the picture in 1948.

As it now stands, the list of items that Europe wants to get from us is more general than specific. Moreover, inter-departmental committees have taken the list and pared it down, chiefly on grounds the supplies are not available. Here is the way the general categories shape up, both as initially requested and as revised. The figures represent total imports and are in millions of dollars.

	European Committee Estimate for 1948	Estimate for 1948 as revised	European Committee Estimate 1948-52
Food, Feed, and Fertilizer....	1,500	1,270	5,400
Cotton	400	350	2,000
Coal	340	370	700
Iron and Steel Products.....	370	230	1,200
Petroleum Products	510	485	2,200
Chemicals	250	200	850
Timber	100	95	400
Farm Machinery	370	100	1,100
Inland Transport Equipment..	200	60	490
Petroleum Equipment	170	130	555
Mining Machinery	80	80	220
Electrical Equipment	150	125	500
Machine Tools and other Machinery	545	450	1,750
Miscellaneous	1,065	1,065	3,030
	6,050	5,010	20,395

A quick glance behind these totals reveals the following:

Among agricultural supplies breadgrains and feedstuffs are the big items. Dairy products and fats and oils are also sizeable.

Of the $2 billion or more of petroleum products, three-fourths are refined and one-fourth is crude.

Coal shipments will bulk large the first year (45 million tons) but they fall off rapidly thereafter.

The steel request originally included 1.5 million tons of scrap in 1948 and more thereafter. This isn't available. Of the finished items, sheet and tin plate come to 744,000 tons in 1948, the peak year.

The chemicals wanted are industrial chemicals, paints, and medicinals as well as a lot of unnamed specialties.

The huge catch-all labeled miscellaneous covers textiles and whatever additional consumer manufactures Europe will seek. Aircraft and surplus ships are other important items in the group.

A number of items on the equipment list could cause considerable trouble. Farm machinery, mine equipment, refining equipment, electrical apparatus, and freight cars are among these. Each is examined in detail below.

These exports under the Marshall program, if carried out, will affect all of U. S. business down to the corner grocery store. In many instances the impact will be so slight and indirect as to be hardly noticeable. But in a few industries the program will loom as a major element, dictating production patterns and setting a limit to capital expansion plans.

It's hard to paint a simple picture of a situation so diverse as this. We try to do so below by dividing the effects of the Marshall program into several broad groups. First we consider the impact of the program on

the general level of business. Next, we cover the impact on leading industries – steel, oil, electrical equipment, farm machinery, and the like – and the effect on business through the creation of shortages in these items. Finally, we examine the influence of the program on farm prices and living costs.

THE OVER-ALL LOOK

The Marshall program comes at a time when certain demands contributing great inflationary pressure on business are beginning to slacken. While it will help hold business at a high level, the program itself is not great enough to maintain a general inflationary pressure. Nevertheless, it will give new strength to shortages that have been troublesome to business. In these latter areas, as well as on the food front, prices will continue firm and may go even higher.

If the program is carried out along lines described above exports to Europe will run about $5 billion. The gain here will offset a decline that has already begun in U.S. exports to other areas. After a careful study of these divergent trends, we conclude the end result is likely to be a total export of goods at a rate of about $15 billion in 1948. However, this rate will only be reached after the program starts rolling. The sale of services – shipping, tourist and the like – will add another $2.5 billion to our foreign account. Moreover, this over-all sum of $17.5 billion probably will run about $9 or $10 billion greater than our imports.

Under the Marshall program, then, our foreign trade in 1948 will be carried toward the peak that prevailed in second-quarter 1947. But the over-all inflationary impact of exports in 1948 is bound to be less than it was in second quarter 1947. Not only is our capacity to produce growing, but certain elements in our domestic demand are almost certain to be less strong next year.

This last fact is important and needs to be spelled out. Indeed, it's impossible to determine the effects of the Marshall program without some idea of what would happen to business without it. The accompanying chart which shows how our gross product has been split up in the past several years serves as the starting point for such an estimate. There it can be seen that the spending of domestic consumers takes the biggest slice of the gross product ($164 billion). However, the share going to business and to government also has been sizeable (about $30 billion each). Alongside each of these the net expenditure of foreigners on our goods seems small. Nevertheless, it has a tremendous importance to a huge number of business firms and industries.

Left by themselves, the spending of consumers and of government would be likely to fall very little if at all next year. But business outlays – spending on plant, equipment, inventories, and residential housing – are another matter. Here the vulnerable items are plant and equipment. Capital expansion has been extraordinarily large for two years, and in not a few cases business is completing its initial post-war program of capacity expansion. Therefore, some decline, but not a large one, is expected in the aggregate of business spending during 1948. This in turn would have some reaction – but again a minor one – on the spending of consumers.

The net effect of such developments should be to place industry in a better position to meet the pressing needs of the Marshall program. This does not mean, however, that the program can be handled without difficulty. The trouble is that many of the items Western Europe most needs are those which would, under normal conditions, continue in tight supply. It is these bottlenecks that business will want to anticipate and, to the extent possible, overcome. Here are the facts concerning the most important of them.

COAL: TRANSPORT IS THE DIFFICULTY

Western Europe wants 45 million tons of coal from the U. S. in 1948. Thereafter requirements drop sharply to 6½ million tons in 1951.

U. S. production of bituminous next year ought to equal the 600 million tons turned out in 1947. If it does we can meet Europe's need. However, the job will call for careful scheduling of delivery. For the real problem in coal is a shortage of coal cars. This has plagued industrial consumers in 1947. Unless car turn-around times are improved (they now average 14 days as against 11 during the war) car shortages will continue through 1948. Under such circumstances, exports to Europe won't permit the accumulation of normal stockpiles – a fact managements in many industries won't like.

Any actual shortage in production that might develop will be limited to special types of coal – particularly the better grades of coking and by-product coal. Europe has concentrated largely on these. Such concentration isn't necessary, but since transport costs (the big element for Europe) are about the same for all grades, Europe has

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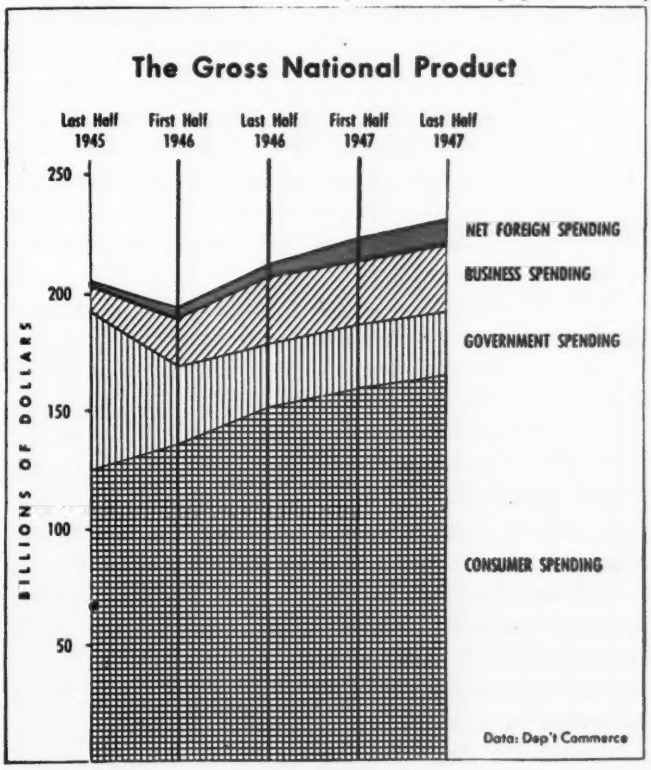
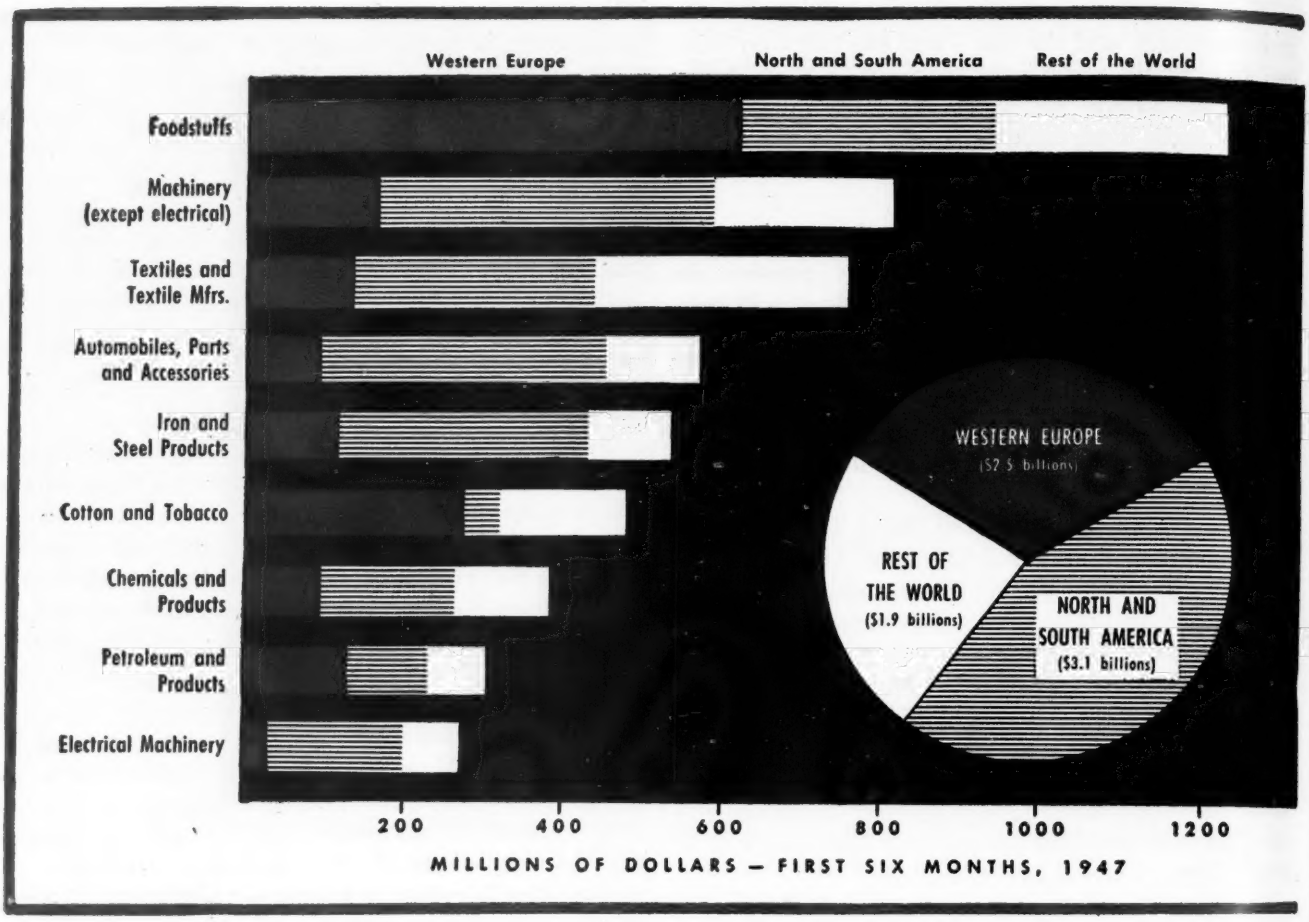




U. S. EXPORTS . . . Where they go — What they are

U. S. EXPORTS THIS YEAR hit an all time high. Shipments in the first six months were at an annual rate of $15 billion, four times the pre-war rate. Since then they have declined, but not greatly. The export rate now is about $13 billion.

Foodstuffs have moved to the top of the export list. The needs of Europe combined with crop failure in Southeast Asia have revived an export that before the war seemed all but dead. About half this record flow has been directed to countries included in the Marshall program.

Next on the list are the durable goods that have come to symbolize the strength of American industry. Machinery, automobiles, and steel products are all in extraordinary demand abroad. In spite of domestic shortages, shipments have been relatively heavy. Thus in one form or another about 18% of our tight steel supply has moved abroad this year. Canada and Latin America have been the big customers, and sizeable quantities of machinery have also gone to Russia. Other than France (which had a big loan for the purpose) Western Europe has not been in the market. They've needed the goods but lacked the dollars.

Textiles have been another huge export group. Here the influx of new foreign customers has been warmly welcomed. For heavy buying from abroad has kept textile output going at a good pace.

Cotton, tobacco, oil, and chemicals are other supplies that bulk large in U.S. trade. Western Europe has been a principal buyer of all except chemicals. Canada and Latin America again have been at the head of the line for these last items.

Regardless of the Marshall Program, some shift in U.S. export trade could be expected in 1948. The recent splurge of foreign buying cannot be maintained if for no other reason than that funds will not be available. U.S. import of goods and services – the chief source of dollars for most of the world – has been only 40% of exports. About $10 billion of loans and relief grants helped keep Europe in the market. At the same time, foreign nations drew down dollar balances and shipped gold.

Net effect of the Marshall program on exports is to provide $4 to $5 billion of trade that otherwise is lacking. Not all this added trade need be with Europe. If the U.S. provides dollars for Western Europe to buy in Latin America and Canada—which it well might—those areas will spend more here. Nevertheless, under the Marshall program much more of our trade will be directed toward Western Europe and the things it wants. These are foodstuffs, industrial supplies, and machinery. Little in the way of textiles or automotive equipment is on Western Europe's shopping list.

sought the best. U. S. utilities, steel and gas manufacturers, and the Great Lakes trade are large domestic users of these fuels. They will continue to feel competitive pressure unless Europe's buying habits are changed.

PETROLEUM — WORLD-WIDE SHORTAGE

Regardless of whether the U. S. provides the full amount of petroleum Western Europe has asked for, industry and households may have to go slower on switching to fuel oil than they desire. Oil already is in tight supply in America, and this reflects a shortage that is world wide. The cause of this shortage lies not only in refining and production bottlenecks. Perhaps even more important is the lack of sufficient transport capacity, particularly pipe-line and tank car. With steel (including pipe and tubes) as it is and will be, this tight oil situation can't take a quick turn for the better.

Europe wants to build up its imports of crude and do a steadily larger amount of processing on its home grounds. Here is the way dollar imports of the two broad groups were initially scheduled by the European Committee at Paris (figures are millions of tons).

	Imports of Crude	Imports of Refined Products
1947	6.1	17.0
1948	8.5	17.7
1949	10.2	19.0
1950	12.6	18.2
1951	18.8	13.7

These requirements are not likely to be met in full during 1948. However, we should at least match and perhaps slightly better the export of 1947. In 1949 the situation should be somewhat easier. But no one will be surprised if refinery construction in Europe lags and more refined products are needed than plans call for.

The European Committee was careful to say these imports were from "dollar areas." That means they are supplied by American companies (who need payment in dollars), but not necessarily from the United States. As a matter of fact, almost 60% of Europe's oil in 1946 came from the Caribbean and the Middle East, as against 20% from the U. S. proper. American companies furnish much of this foreign oil and any increase in exports probably will flow from foreign supplies.

All this is not to say that the export of oil from the U. S. proper is not considerable. It is, with exports this year running at a rate of more than $600 million. About $250 million of this—chiefly refined products—has gone to Europe. From the standpoint of refining capacity alone, shipments of refined products from the U. S. could, in a pinch, be stepped up slightly. But capacity also should be available in the Caribbean and the Middle East. It makes economic sense to ship from these other areas and they should get the business.

CHEMICALS AND FERTILIZER

Nitrogen fertilizer is the one U. S. chemical product high on Western Europe's priority list. Industrial chemicals and pharmaceuticals are wanted, but are not likely to be purchased in quantity if funds run low.

Nitrogen, of course, is in extremely short supply the world over. Moreover, this shortage probably will not be licked until the early Fifties. If Western Europe were to receive the full 319,700 tons of nitrogen it desires from the Western Hemisphere in 1948, consumption in the U. S. would of necessity be reduced. Not only would commercial exports have to be increased, U. S. imports would also decline. Large supplies (180,000 tons) from Canada and Latin America make the U. S. a net importer on commercial account.

The likelihood is that Western Europe will get more nitrogen next year than this. However, the advance will come out of a small expansion of production, leaving U. S. consumption what it was. From the U. S. some 70,000 tons (6½% of production) may be shipped. This would equal commercial exports to all areas in 1947.

The U. S. also will provide phosphates to Western Europe – perhaps 80 to 85,000 tons. However, production should be adequate to carry this with little trouble.

Among other chemical products, Western Europe would like the following (figures are millions of dollars).

	1948	1948-51
Industrial Chemicals	50	190
Paints and Pigments	40	145
Coal Tar products, Medicinals, etc.	160	515
	250	850

No forecast of our actual export of these products is possible. However, shipments are likely to run considerably lower than the above figures suggest. Western European production can fill the most essential needs. Since supplies here are very tight on many items, exports to Europe may not greatly exceed those of 1947.

STEEL — STILL THE NO. 1 PROBLEM

No material caused more trouble for U. S. industry in 1947 than steel. The extent of the shortage in 1948 – and the possibility that it might end – has been a key element in the plans of many producers for next year. Under such circumstances the needs of Western Europe are bound to be weighed and measured with care.

Here is what the initial report from Paris asked for in the way of steel (figures in thousands of tons).

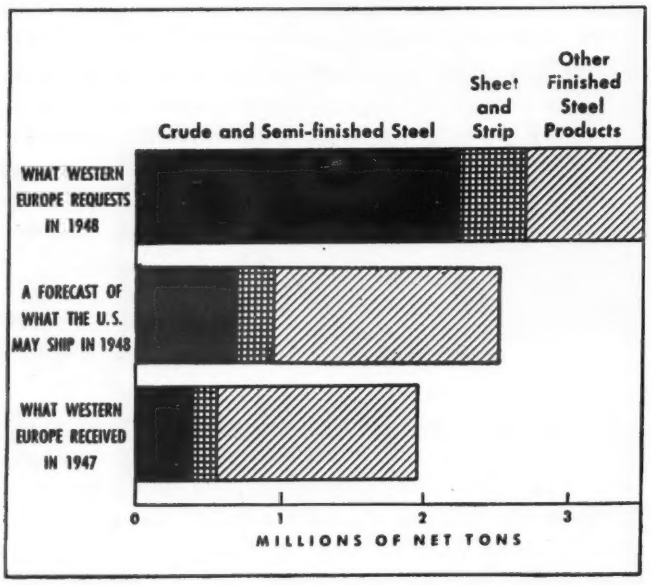
	1948	1949	1950	1951	Total
Ingots and semi-finished items	2,244	2,299	2,475	2,387	9,405
Sheet and strip	424	198	34	...	656
Tin plate	320	314	296	275	1,205
Other finished steel	500	...	...	...	500
TOTAL	3,488	2,811	2,805	2,662	11,766
Steel scrap	1,500	2,000	2,300	2,500	8,300

At first glance these requirements don't appear too hard to meet. This year we have been sending steel abroad at the rate of 6.2 million tons annually. Canada and Latin America took more than 3.5 million tons of this. Europe took only about 2 million tons. Apparently the problem could be solved by shifting exports.

Unfortunately, the answer is not as simple as this. What Western Europe wants – it's really Britain and Italy that want it – are steel ingots and other semi-finished items (billets, blooms, etc.). These the U. S. has been consuming itself. Exports have been almost entirely in the form of finished products.

From the standpoint of the steel industry, shipment of semi-finished items has two bad results. Certain finishing capacity would be made idle. As a matter of fact, the amount of semi-finished steel Western Europe wants is 40% of the supply non-integrated producers of steel products have been able to get from the integrated producers (who turn out the ingots). In addition, badly needed scrap from the finishing process would be lost.

The Dilemma in Steel



What we shall do about this hadn't been settled yet. Those of the President's Advisory Committee on Foreign Aid who specifically studied the question felt very little semi-finished steel should go abroad. This, however, would hit Western Europe hard. A likely compromise – and one suggested by the Government agencies reviewing Western Europe's requirements – would substitute finished items for semi-finished. Shipments of the latter in 1948 would be held to around 650,000 tons, less than a third of the initial request. But export of finished steel (other than sheets or tin plate) would jump to 1,150,000 tons. On one matter, however, all seem agreed. No straight scrap can be sent. The U. S. just doesn't have it.

Where does the steel consumer stand on all this? From his point of view the export of any steel makes life more difficult. No matter what is shipped he will feel it next year. Here is the probable situation under either the initial request or as it may be revised.

a) Overall the supply will remain about as tight as it has been this year. Although demand on the part of equipment producers is expected to decline somewhat, this will be offset by heavier requirements for construction, transport, and export. Late in 1948 and early in 1949, addition of 2.5 million tons of basic ingot capacity may help somewhat.

b) Steel sheets will continue to be a headache, but probably slightly less of a one than in 1947. Long awaited additions to capacity are beginning to come in. By the end of 1948 the total should stand 3 million tons higher than at mid-1947 (a gain of about 18%). Western Europe probably won't get all it has asked for. Shipments might not exceed 225,000 tons, half the initial request. And most of the increase over the export this year (164,000 tons) is likely to come out of shipments that have been going to other areas.

c) Tin plate also seems destined to remain tight. But here the trouble is as much tin as steel. Exports this year are 561,000 tons, but only a fourth has been shipped to Western Europe. If Europe's requirement of 320,000 tons is to be met, other world areas will probably bear much of the burden.

EQUIPMENT BOTTLENECKS – COAL EQUIPMENT

The equipment items are the toughest part of the Marshall program to assess accurately. The European Committee itself failed to develop any clear-cut list of what will be needed. The large sum labeled "mine equipment," for example, includes a certain amount of electrical apparatus. And no detailed breakdown whatsoever was initially presented for the broad equipment groups listed earlier. Some of these shortcomings will be rectified by information now being obtained. In the meantime, equipments lines where the added needs of Western Europe undoubtedly will cause difficulty can be earmarked.

Coal equipment is one such item. The total of $80 million which Western Europe wants in 1948 is half again as much as our export to the entire world this year. Today order backlogs run from 6 to 24 months on many types of mine equipment. Fortunately, some that are most tight – mine locomotives, coal loaders, coal cutters (except the long wall type) – apparently are not wanted by Western Europe in quantity.

Equipment that is needed quickly includes pneumatic tools, conveyor belting, and long wall cutters. These are all adaptable to European mining and can relieve bottlenecks that now exist in supply. Conveyor belting is the most difficult of these items. However, the main trouble in meeting Western Europe's coal equipment needs may arise from another direction – the supply of machinery, parts, and materials for producers of mine equipment in Britain and on the continent. Without help, European plants can't meet the production schedules set for them.

PETROLEUM EQUIPMENT

Western Europe may spend about $130 million on U. S. petroleum equipment next year. This is three-fourths of what was originally planned, but it comes close to our total export of petroleum equipment in 1947. The entire expansion program projected by Western Europe's oil industry will run to some $1.8 billion in four years, with a third for U. S. equipment.

Big items needed probably will include steel pipe and tubes, pumps of many sizes, large vessels (fractionating towers), turbo-generators, and well drilling apparatus and parts. Probably the most difficult problem here is steel tubing. Orders are now on the books for production into 1951. Very little has been exported, and what Europe gets in 1948 will clearly be at the expense of domestic consumers. Other trouble spots are pumps, turbo-generators and large vessels.

Our own petroleum industry is undertaking a record capital outlay on production and refining of about $3 billion this year and next. Part of this is in the Middle East and Western Europe itself. Therefore Western Europe's oil industry will compete with American companies for scarce equipment and supplies. Such competition is to be expected in Europe, as well as here.

Since the American program is much further advanced, Western Europe's expansion plans may well lag. This certainly is likely to be the case in the Middle East. Almost half the U. S. equipment wanted by British and French companies is for projects in that area. Many of these require the help of American engineering firms, since U. S. engineers are most familiar with recent developments in installation and design. This engineering talent is itself a scarce element in the petroleum expansion scheme. It may prove the factor that sets a slower pace than Western Europe had planned.

FREIGHT CARS — DELIVERIES LAG

Freight cars for Germany are the only import of inland transport equipment which Western Europe urgently needs from the U. S. Production within the area can take care of most other requirements.

Import requirements initially were set by the European Committee at 103,000 cars, with 89,000 needed in 1948-49. European equipment is less than half the size of ours; so in terms of U. S. freight cars this boiled down to about 20,000 cars in 1948 and 19,000 in 1949.

Freight cars, of course, are one product whose need in the United States is urgent. Car builders have more than 100,000 cars now on order. Thus far their deliveries have failed to average more than 6,000 cars a month.

The President's Committee on Foreign Aid, surveying the tough situation here and in Germany, finally recommended a shipment in 1948 of 20,000 cars (the American equivalent is 8,000). To the extent this is met, American railroads will have to accept somewhat later delivery. The number involved is not great enough, however, to make any appreciable difference in the overall freight situation. This is likely to remain about as tight in 1948 as it has been this year.

ELECTRICAL EQUIPMENT

Equipment for Europe's electrical industry may prove less troublesome than originally expected. Western Europe plans to produce all the heavy apparatus required for its vast generating plant expansion — at least for the first several years. Thereafter, U. S. producers will be in a position to help them if they need it.

The four year need for U. S. equipment originally was set at $500 million. Some $300 million of this is to be spent on items that do not include any heavy apparatus. Materials and equipment required by the electrical manufacturers themselves are on this list, although no details are given. Its exact effect on our own electrical industry can not be measured until we know more specifically what is involved.

The remaining $200 million will go for hydro equipment on projects of an international character. These may possibly be financed by the World Bank and an immediate start on the equipment is probably not necessary. U. S. electrical equipment producers certainly could not get such work well under way for several years. But certain shipbuilding firms might begin on turbine equipment if desired.

If the electric equipment story ended at this point, it wouldn't be so bad. However, the above figures don't give the full picture. Large motors, turbo generators, and other items are also required for expansion in the petroleum, coal, and steel industries. In many cases these very products have held up the completion of new capacity in this country. Even without Europe's demand they would continue tight well into 1949.

MACHINE TOOLS AND OTHER MACHINERY

Western Europe hasn't set any fixed estimate of what it might spend on machine tools, construction machinery, and other equipment. If the entire program went as initially planned, about $550 million would be available in 1948 for such products. However, the amount actually spent will probably be considerably less than this. No direct aid is likely to be given by the U. S. for the purchase of such equipment; so the countries concerned will have to use whatever funds they can scratch up themselves. How much this will be no one knows.

Machine tools are certain to bulk large on this list. Shipments to Western Europe in first-half 1947 were at an annual rate of $75 million. They should be in larger volume next year. Western Europe appears to hold a fairly adequate stock of general purpose tools. But the expansion of capacity in a number of metal working lines, if carried through, will require a large variety of special purpose tools.

Machine tool needs can be met without difficulty. However, one group of products that might cause trouble is construction equipment. This has been in great demand here. While some items are approaching an easier supply position, others like cranes and power shovels remain very tight. Western Europe has spent a modest sum on U. S. construction equipment — $16 million in the first six months of 1947 — but it would like to spend more. If it tries to do so, exports to Canada and Latin America may have to be cut.

Demand for U. S. textile machinery by Western Europe also has been relatively small — about $7 million in first-half 1947. This situation is expected to continue.

with the region producing most of what it needs itself.

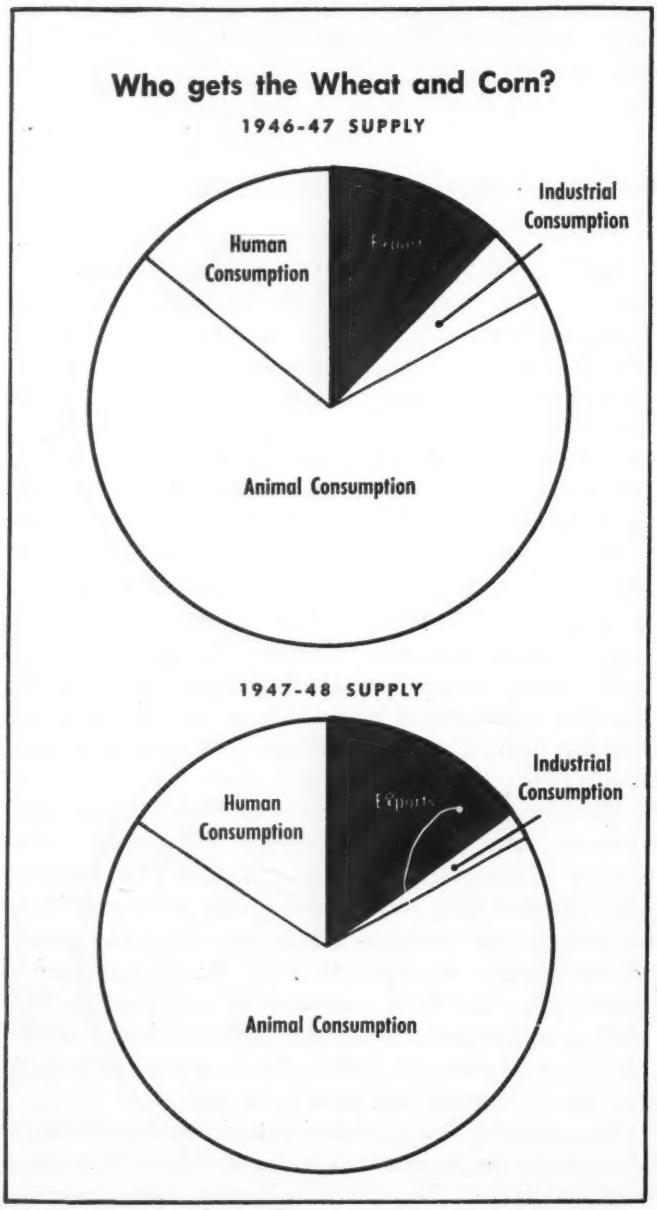
Steam engines, canning machinery, milling machinery, and a long list of other equipment items round out Western Europe's capital requirements. Most of these can be supplied without many of the difficulties reviewed above. And there is one product of great importance to America which Western Europe plans to satisfy largely from its own plants – automotive equipment, particularly passenger cars.

EQUIPMENT FOR THE FARMER

Western Europe's first request for farm equipment in the 1948-51 period was equal to our entire output of 1947. Since this amount obviously can not be spared, the request has been scaled down very substantially. In 1948 shipments are not likely to be more than $100 million, with the new four year goal something on the order of $600 million (half the initial figure).

American farmers can spare this amount of equipment in 1948, although they certainly would buy it themselves if it were not set aside for Europe. Production is likely to run to about $1.35 billion, up some 10% from 1947. But other foreign customers also will have a bid in for a part of this. Canada and Latin America, who bought some $105 million of the $175 million of farm machinery exported this year, need further equipment badly and cannot be shut off with nothing.

After meeting the European and other export demands, American farmers still should receive more new equipment than in any other year except 1947. Thus, they will continue to make considerable progress in their drive to mechanize, although the pace will be slower than they would choose. Above all, the demands of Western Europe and other countries should not be too large to interfere with U. S. food production.



THE FOOD SITUATION

Food may turn out to be one of the chief trouble spots of the Marshall program—particularly for American business. Because of the program, food exports will be larger, domestic consumption somewhat smaller, and prices higher than they otherwise would be. In spite of this, Americans should eat about as well next year as in 1947. However, if prices are bid up in the process, wages and industrial costs may climb with them.

As matters now stand Western Europe would plan to spend about $1 billion on U. S. food in 1948. This is less than they spent in 1947. It also is less than Western Europe feels is necessary to realize the minimum standard of living it set up as a goal for 1948. However, the overall supply of grains – by far the largest commodity on the food list – is down this year by 14%. As a result estimates of Europe's food imports have been reduced.

Here is what went into the record export in the fiscal year 1946-1947. (Figures are thousands of long tons).

	Shipments to Europe 1946-7	Total Exports 1946-7
Wheat and Flour (grain equivalent)	6,638	10,520
Other grains	2,572	4,538
Fats and Oils	156	233
Meat (carcass weight equivalent)	195	224
Dairy Products	322	493
Other Foods	1,266	2,425
Total Foods	11,149	18,433

The President's Committee on Foreign Aid has recommended Europe receive about the same total foodstuffs as last year. However, the product mix will have to be changed. Moreover, the rest of the world will get about a million tons less. Wheat will substitute for corn, but even then the total supply of grains available to Europe will be down 700,000 tons or more. Half of this may be made up with a heavier shipment of fats and oils, including peanuts. Dried milk solids, dried fruits and other products will close the rest of the gap.

There is no doubt the U. S. can send abroad whatever foodstuffs Congress finally agrees upon. The big question is whether this can be done without forcing prices higher. Wheat shipments, for example, may run 40% greater than would normally be exported under current circumstances.

Unfortunately no final answer on food prices is possible. On the supply side much will depend on how next years crops turn out. So far crops are off to a bad start, with winter wheat probably below that of a year ago. As for domestic demand, consumers are likely to have at least as much purchasing power next year as this. The problem is to persuade them to use it on commodities that embody less grain.

When all these considerations are added together it is apparent that food prices over-all do not stand much of a chance to fall markedly in 1948. On the contrary, there is more than a small chance they will rise. Moreover, under the Marshall program exports in 1949-50 would still help support farm and food prices. Any substantial decline could be initiated only by a fall in domestic consumption. Needless to say, these are matters that are important to the business community.

Long Range Problems

A PROGRAM of the size Western Europe has set for itself inevitably will influence American business over the longer run. New industries are to rise, old ones are to be rebuilt and expanded, exports are to be pushed — all this has a direct bearing on America's foreign markets of tomorrow. Any sound and final judgment concerning the Marshall program, therefore, must weigh certain long run considerations as well as the short.

These longer range considerations are summed up most simply in an assessment of the broad pattern of Europe's future trade. Here a few key trends serve as useful signposts. They are:

a) Industrially Western Europe is preparing to make itself more independent than before the war. This will reduce its imports from the United States. After 1951 export of American manufactures to Europe will be concentrated largely in specialized items which this country has a superior knowledge and skill to produce.

b) Prior to the war Western Europe was primarily an exporter of textiles, industrial products and high quality consumer goods. Industrial revival is along the lines that will push these same products. However, Western Europe's program for expanding industrial capacity points to one significant modification. Capital goods exports — electrical equipment, industrial machinery, finished steel — will bulk much larger than at pre-war.

c) Western Europe's world trade must be considerably larger than in the late thirties. Two developments account for this. First the split in Germany and Europe makes necessary a much larger import of essential foodstuffs and materials from outside the Continent. Second, Europe now must pay for a larger share of its imports with exchange derived from exports. In the Thirties, about one-sixth of Europe's imports represented a return on investments held abroad. While this margin is not eliminated, it has been cut substantially.

d) By far the largest items on Western Europe's import list will be foodstuffs and raw materials. These needs to some extent must govern the location and character of the markets to which it exports. The U. S. must continue to be one such market, for Europe will need our wheat.

A survey of Western Europe's import needs in 1951 shows that Britain and Western Germany are the two countries to whom world trade will be of decisive importance. Other countries will trade as they always have. However, their ability to feed themselves to a large extent lessens their trade burden and makes possible the concentration of much of it within Western Europe itself. It is Britain and Germany, therefore, that are likely to become America's heaviest competitors.

Britain has the world's greatest food deficit. Moreover, its factories are largely engaged in converting the raw materials of other countries into finished goods. Britain therefore must export or die, and that is more true today than ever. The British now have set an export goal that would boost shipments to 175% of their pre-war volume. Later they may pare this. Nevertheless, an export volume at least half again that of pre-war will be necessary for Britain to restore its living standard.

Some clues to what and where Britain will export are available in its current trade pattern (see chart). A close study of this pattern leads to one broad conclusion. The British are concentrating on the export of the same general lines which the U.S. will push. Machinery, automobiles, iron and steel products, electrical goods — these are items that even today stand high on the export lists of both Britain and the United States. Britain in particular must turn to durable goods of this character to replace smaller coal and textile exports.

Prior to the war Britain sought to direct exports primarily to two areas – her empire and Western Europe. Except for foodstuffs from Argentina, British imports from South America were small. This situation has not changed, and there is good reason to believe Britain will seek to maintain it. As the chart shows, about half Britain's postwar exports have been allocated to the Empire, and another quarter to Europe.

Other than in Canada, U. S. firms find it hard to get into this Empire trade. Empire countries have large sterling balances and lack dollars. It is not surprising, then, that they use dollars chiefly for goods Britain can not itself deliver. Such a situation may well last.

The German position is somewhat different, but not radically. Today Western Germany's population of 48 million is almost a fourth greater than in the late thirties. Yet the region can produce little more than half the food it requires. Unlike Britain it must start from scratch in order to develop export markets so as to pay for its food.

Coal will be one money maker for Germany, but it won't earn exchange in all places from whieh Germany must buy. A likely development is the resumption of shipments of those metal products and chemicals which the Ruhr can produce efficiently and in quantity. Iron and steel products, machinery, chemicals and possibly electrical equipment might be expected to flow from German plants for sale on other continents.

South America, with its food and raw materials, is a natural target for German trade. Such an exchange grew rapidly in the twenties, only to fall victim to the great depression. By the late thirties it was again on the road to revival. The third great push for German-Latin American trade is expected in the fifties.

THE FAR EAST

With Britain enlarging its trade to the Empire and Germany coming into other markets, U. S. traders certainly will feel a competitive pressure that is not present today. How tight that pressure is may hinge on developments in yet another region – the Far East.

The Far East is a vast agricultural and raw material area that has hardly moved to the threshold of industrialization. Yet it has great centers that lend themselves to industrial growth. If political stability were to be established in the Far East, the way would open to a trade greatly benefitting both Europe and the United States, as well as the Far East itself. A surplus of rubber, tin, cotton, wood fibers, and even foodstuffs might then be produced and exchanged for the industrial products of the West.

The Far East, then, is one of the big unknowns in the foreign trade equation of the next decade. Another unknown is the reestablishment of trade between the East and West of Europe. Western Europe's plans count on such trade, and it makes good economic sense. But no one can say for sure that economic sense will prevail in this instance.

These unknowns make any final judgment about the long range success of the Marshall program impossible. This much is certain, however. Without the restoration of East-West trade in Europe, a large expansion of Far East trade becomes an absolute essential. In the absence of both, Western Europe cannot possibly achieve stability by 1952.

Pros and Cons

ANY BALANCE SHEET set up by the business man on the Marshall program will carry a number of items on the liability side. Some of the main entries are these:

The program will be costly – perhaps as much as $15 billion. Through their tax bills business men will bear a good share themselves.

At least for 1948 a number of troublesome bottlenecks will be sustained and even magnified. As a result some producers won't realize the expansion they plan.

The high cost of living, the peg on which many labor troubles hang, will move down very little, if at all, and it may move up.

In helping Europe to reequip itself, American industry is arming a potential competitor. Moreover, the arms it offers are of the most up-to-date variety.

There is no guarantee the program will succeed; as a matter of fact certain conditions essential to its success make it look like a risky bet indeed.

Obviously none of these shortcomings can be taken lightly. Against them, however, can be placed some very weighty items on the asset side.

First, and very important, is the simple but humane consideration that without U. S. aid people in a number of Western European countries will be placed in dire straits. At best they will lack adequate food for a healthy life. At worst they will starve.

The economic situation in Western Europe has a profound political and military meaning for the U. S. This is a matter of direct interest to the businessman. If Western Europe ever loses its political independence to another foreign power, the ultimate cost to America will make the expense of the Marshall Plan look like a mere pittance.

Finally, the Marshall program offers the only hope of realizing some measure of economic stability in a world that today appears permanently upset. In this regard the program can do no harm, but only good. Even if it falls short of its stated objectives, Western Europe will have taken a long stride forward.

The assets outbalance the liabilities.

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To Keep Apace—Merchandise!

A DISTRIBUTOR of frozen foods complains that chain store corporations and other large volume retail outlets are now buying direct from certain frozen food packers and bypass him completely. He is carrying a complete line and believes he offers a better distributive service than the packers of the unassembled lines located in various distant cities. But the buyers of these volume retail outlets give him little business and seem little impressed by his sales arguments. He is genuinely disturbed and, to put it briefly, he wants to know what's wrong.

As a matter of fact, an association of frozen food distributors has been carrying on a program during the past two years urging packers not to bypass distributors by selling direct to retail outlets. But, so far, this has not forestalled some direct sales.

Frozen food distributors, just like the wholesale distributors of other processed foods, should prepare themselves for some direct selling—from packer to retail outlet. Such buyers and sellers are merely making use of an economic advantage. In food distribution it has always been thus. The elimination of second-men in food distribution means the saving of brokerage and those profit margins taken by wholesale distributors.

For Some—Critical Times Ahead

But this is not the major problem faced by wholesalers and distributors of all kinds of processed foods. The promises, made during war times, of a postwar competitive era, the likes of which had never been seen before, are now coming true. Too many small producers of processed foods have always been woefully weak on insuring the sale of their products after they become the property of second and third owners. Unfortunately, a sale of food is not complete until the food itself is eaten. The smaller producer is no different from the large manufacturer—he must promote consumer acceptance of his food products. By creating consumer demand for his brand of foods he will place himself and his distributor in a more advantageous marketing position. He can do this by using various advertising media and by store demonstrations and sampling. It costs money, of course, but it also costs money if the factory is idle.

Most food manufacturers know that wholesale distributors and retailers are only integral parts of a merchandising program. These distributive factors cannot do the entire job of promoting the sale of an unknown food product. Wholesalers and retailers are anxious to supply the consuming public with the brands and kinds of foods it wants. But, the overall promotional and merchandising job is up to the manufacturer. He must create a consumer demand for his brand of food and then coordinate and integrate the efforts of the wholesalers and retailers with his program.

Today, the art and technics of good merchandising are sound and scientific. Many astute food manufacturers—and their advertising agencies—are using modern merchandising methods so effectively that even hard-boiled chain store managements are either outwardly or tacitly admitting that they prefer to stock the well advertised brands. This is especially true in self-service outlets where brands with highest consumer demand are the ones that account for volume sales.

Opportunity for Modern Merchandisers

So pronounced has this trend become that many sales managers, acutely aware of this new sales potential, are pressing more vigorously and with increased merchandising forces, for even greater consumer acceptance for their brands. Noticeable progress in this direction has been reported in a big mid-western chain where well advertised brands now occupy most of the shelf space formerly occupied by carefully controlled proprietory brands backed by limited advertising.

Any realistic distributor cares relatively little about whose brands he sells as long as consumer demand maintains and increases his competitive position at a satisfactory profit. It is obvious that the tremendous jobs of merchandising done by large food corporations are successful. They could not exist without such elaborate sales promotion and advertising programs. Largely in relation to volume of production output, the smaller food processor must also do a similar merchandising job.

Where does this leave the small distributor? His lot, like that of the broker and the small wholesaler of canned foods, can be strengthened and improved through means of modern merchandising methods. Because their functions are sound, there will always be a place for the modern aggressive types of small food processors, brokers and distributors in our food manufacturing and distribution industry.

C. R. Haughhurst

ASSOCIATE EDITOR

The Talk of the Industry

• VITAMIN A has been synthesized by Organon in the Netherlands from a substance in a tropical grass abundant in Indonesia and Australia. If the new product becomes commercially available at a lower cost than fish liver oils, the fisheries industries will lose a profitable by-product.

• PIMIENTOS, Pimentos, or Pimentas? A recent request for aid in setting up a plant to process and preserve pimientos has called to mind the indiscriminate spelling used by many Americans. The unabridged dictionary is not of much aid on this point and is far behind trade usage for it gives pimento as an alternate meaning of pimiento.

Pimento is a name for allspice.

Pimiento is, according to Webster, the name for "the fleshy fruit of the Spanish paprika used as a vegetable, for stuffing olives, etc. Pimento."

Pimienta in Spain means the common black pepper.

• SPEAKING of British biscuits, we once asked an American biscuit manufacturer how come we had to buy from Britain if we wanted a really top quality piece of goods. Quoth he (they were quothing in those pre-depression days):

"We don't make biscuits as good as we can; we make them as good as we can sell. We know how to produce biscuits just as good as any firm in the world—sometimes a lot better. But when we go into the very fancy lines the market is very limited. Take Huntley-Palmer of Reading, England, which, I believe, is Britain's biggest. With the whole world to sell to, the Huntley-Palmer plant is not as big as some of ours that serve a single metropolitan area."

• GRAPE growers of California recently asked federal aid in the form of support prices for raisins based on a parity price of $160.82 a ton. whereas last year the market for raisins went to about $300 a ton. Such high prices as prevailed last year have markedly curtailed consumption. According to the plans, the 1946 crush of grapes for wine making, 1,800,000 tons, will be curtailed to 850,000 tons in 1947. On account of large inventories the bulk of the California grape crop is to go into raisins for which a support price is asked.

Reduced taxation on wine would seem to be a better way to move the product, rather than a subsidy. But, of course, it is not as sure a guarantee to the grower as a support price.

• IT is a strange commentary on human nature that anyone who is able to buy a new automobile can turn around and sell it second-hand for maybe $500 more than he paid for it. And be it to the everlasting credit of the car manufacturers, they are about the only manufacturers of consumer goods in the country who are selling their products for less than the market is willing to pay. Which accounts for the presence of new cars on used car lots. Also, why used car dealers can advertise "used" cars that have almost no mileage on them.

This is related because of a fundamental difference in the attitude of people toward the things they want but do not need, and the things they actually cannot live without—like food. People will sacrifice to get the things they want, but they will scheme and connive to hold down the price of things they need. Thus, the cost of food for the body politic can easily become a political issue. And it does become a political issue as soon as it becomes an economic problem of the nation, which is the status of the problem today.

• AMERICA'S national mystery: The Industrial Mobilization Plan and what became of it just after Pearl Harbor has come in for an over-due airing. Many of the highest government officials have professed all along that they never knew what happened to it. Presumably F.D.R. ordered it suppressed —but why?

Let us hope that the latest venture in planning for industrial mobilization in case of an emergency, headed by R. R. Deupree of Procter and Gamble, will have a better outcome.

Hors d'Oeuvres

• *The fish industry has no objection to being quoted as fully in favor of the President's food conservation plan.*

• According to Farm Journal, 95 per cent of the Illinois housewives prefer milk in paper containers. The Elmo Roper organization says a national survey reveals that 65 percent of the housewives want their milk in glass bottles. Somebody's carrying individuality too far in this case.

• *American Dairy Association reports that during the war years "simultaneously with gun powder plants, huge milk powder plants were erected throughout the great milk flow areas." Plenty of boom for anyone looking for a pun.*

• In case some of our European friends get the wrong impression, that National Cat Week we celebrated last month was not a Luckman committee inspiration.

• *The Russians are reported to be making melons grow where they wouldn't grow before by grafting them to pumpkins. This could turn out to be something to really scare you on Hallow'een.*

• War Assets Administration says humorists will have fun with the 85,000 lb. of garlic salt they have for sale. A bad cold might help you to enjoy it even more.

• *Also WAA will be soon offering free in major U. S. seaports "a ship-to-shore variety of foodstuffs which outlasted the appetites of sailors at sea." Here's a chance to really test your landlubber appetite.*

• And now the American Magazine discloses that we are too smug about our well fed land. We rank 13th in per capita milk consumption, 12th in animal and vegetable protein intake and 6th in meat consumption. Looks like this depending on ourselves for food isn't so good.

• *A* $47,000 *research project of the Department of Commerce plans to turn Alaska salmon waste into* $10,000,000 *worth of drugs, according to Pathfinder. We sometimes make plans of this nature, too.*

• National Dairy Council tells us they are sending 5,000 copies of the Ice Cream Song to key members of the industry. Looks like they are getting all keyed up over this.

• *What with high prices, food conservation and confusion, it's been quite a year. But since all is supposed to be well that ends well, let's wind it up with a most Merry Christmas.* J.A.J.J.

LANCASTER courtroom is jammed as Chairman Hope (under flag) gets the second hearing underway. The witness is second from right.

The Farmer Gets A Hearing

The House agricultural committee gets grass roots' views on what our long range farm policy should be and how the proposed new Agricultural Act can best contribute to the welfare of the farmer

By J. A. J. JONES, Assistant Editor, "Food Industries"

PROPOSED revamping of the federal agricultural legislation under an all-embracing Agricultural Act is going to have hard going if the grass roots hearings, conducted by the House Agricultural Committee, are any criterion. Starting in Durham, N. H., October 13, the committee made its way across the country, winding up at Fresno, Calif. on November 17. Stops were made in Pennsylvania, North Carolina, Alabama, Wisconsin, Iowa, Missouri.

Price Supports

The hearings demonstrated that subsidies are the subject on which farmer opinion is most varied, in the different areas. Widely opposed to these price supports in New England, the farmers were vehemently in favor of them at Montgomery, Ala. Closer to the middle of the road, and perhaps more typical, were the Middle Atlantic States' farm representatives, heard at Lancaster, Pa., on the second stop in the committee's cross country jaunt. First hand coverage of this meeting, held before 13 members of the committee under the chairmanship of Rep. Clifford R. Hope, revealed the basically sound aims of the individual farmer, which, however, were not always in agreement with those of farm organizations.

Moderate Views

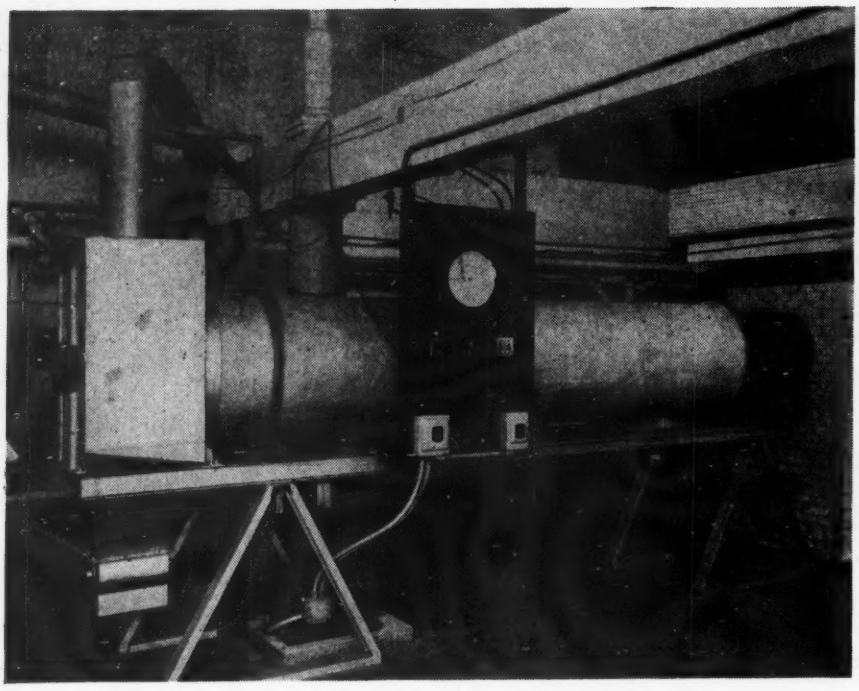
Opinions at Lancaster were by no means unanimous on subsidies. They ranged from no supports at all to 100 percent parity, based on 1947 prices. But these were extremes. The majority of more than 40 witnesses struck a far more moderate tone. Most admitted a strong dislike for price supports, but the censure seemed to spring more from a repugnance toward federal controls than from any aversion to supports themselves. The statement of one dairy farmer sums up, perhaps, the general attitude of the growers in this section. "I don't believe in subsidies," he said, "but I have had to take them or go out of business."

There was plenty of evidence, too, that these farmers are not prepared to accept protection of any kind as a form of charity. The farmers have been subsidizing the consumer for years, was the attitude of one farm bureau executive, by overworking the soil. With no new virgin soils to go to, it is up to the nation as a whole to put back this squandered fertility. The farmer can not do the job alone.

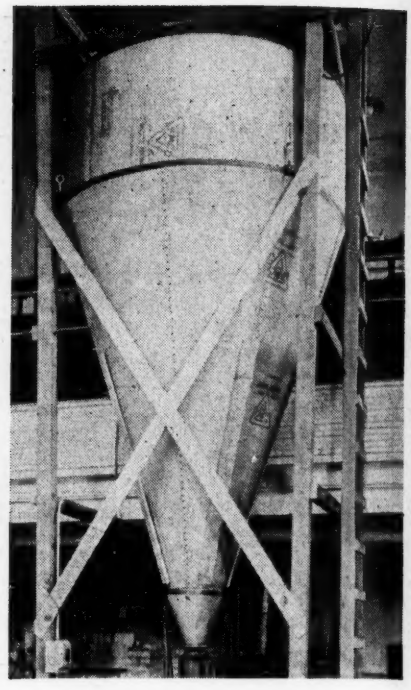
Political Aspect

A sharp cleavage on the subject of subsidies could be noted between the Democratic and Republican members of the committee. In questions put to early witnesses, Reps. Stephen Pace and W. R. Poage, both Democrats, sought to defend subsidies by asking how the farmer could prosper without protection in an economy where industry was protected by high tariffs on low cost imports and labor is supported by minimum wage laws. The witnesses to which these questions

(*Continued on page* 212)



DRYING TESTS have proved the workability of the rotary drum drier in successfully obtaining low moisture content with insignificant cell rupture.



CYCLONE is used for granule recovery when drying is done in an air-stream duct.

Instant Mashed Potatoes

Mashed potatoes of excellent flavor, color and texture are quickly made

By J. W. GREENE[1], GRANT C. MARBURGER[2] and F. A. ROHRMAN[3]

ONE of the outstanding commercial food products to be developed since the war is the "Instant" mashed potato granule, a new product which seems to be just what the commercial markets ordered.

The revolutionary, yet practical process used to manufacture these granules eliminates all the texture objections present in every former type of dehydrated mashed potato. It produces granules that, when rehydrated, form light, fluffy mashed potatoes, completely free of any lumps or pastiness.

In addition to texture advantages, the Instant mashed potato process adds further appeal through easy, instantaneous preparation. Its speed and ease of preparation, combined with the high quality in flavor, color and texture, should make for extensive use of this new type of mashed potato products in the civilian market.

Instant potato granules were born out of tests begun by the Army to improve the existing mashed potatoes. Flavor and color acceptability had been achieved, but the product was pasty and sticky, often full of lumps. The process was developed by Kansas State College and the Quartermaster Food and Container Institute for the Armed Forces, both places working from previous fundamental discoveries and from research which had its start in a Swiss laboratory. Considerable development was made in England and in various places in the United States before this final development. The British commercial development was based on the fundamental discovery that vegetable cells may be toughened by cooling. That resultant product, however, was far from perfect and involved excessive manufacturing costs.

Two Steps

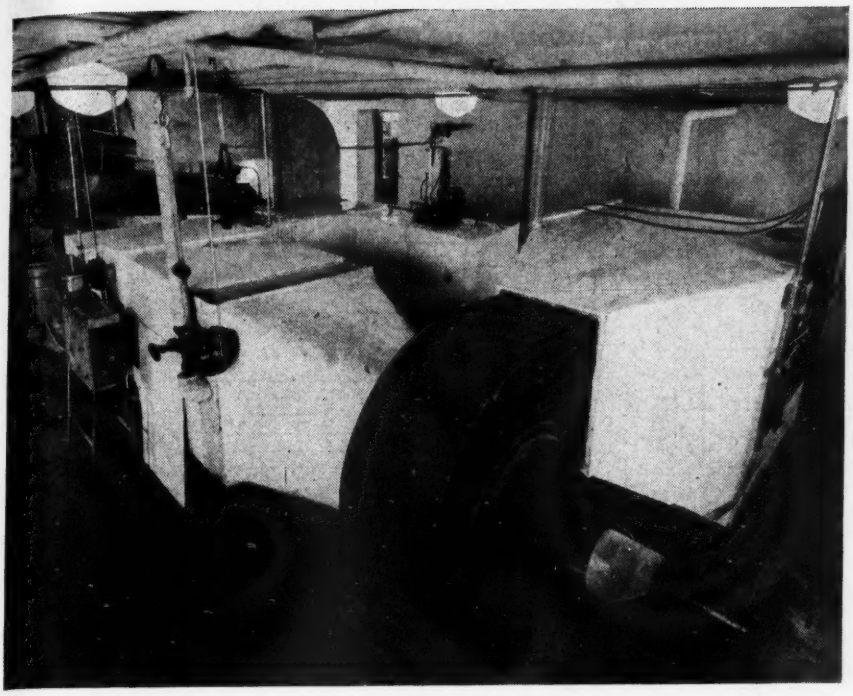
The process is dependent upon two basic steps—freezing, and mechanical removal of the bulk of the moisture. The fundamental aspects involve freezing, which toughens the starch-bearing cell structures of the potato. When any potato is sliced, the cells are cut, allowing starch to separate from potato cells structure into the end product as free starch.

Toughening the cell membrane permits subdivision of the potato into granular size without cell rupture, and thus eliminates liberation of any appreciable amount of free starch. If ruptured cells are present, an unsatisfactory product results because of the gummy, sticky characteristics of the rehydrated potato. The preservation of this cell structure is one of the important phases of the successful Instant mashed potatoes.

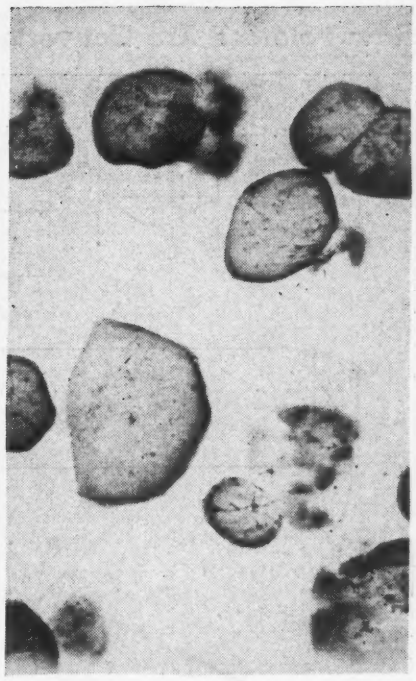
The second basic step of this process, the mechanical removal of moisture, permits a simple, though effective, solution to what has been a major problem in previous attempts. Necessary to this phase of the process is the removal of sufficient moisture so that the potato

[1]Professor and Head, Department of Chemical Engineering, Denver University, Denver, Colorado.
[2]Head, Engineering Section, QM Food & Container Institute, Chicago, Illinois.
[3]Executive Director, Engineering Experiment Station, University of Colorado, Boulder, Colorado.

The subject matter of this paper has been undertaken in cooperation with the Committee on Food Research of the Quartermaster Food & Container Institute for the Armed Forces. The opinions or conclusions contained in this report are those of the authors. They are not to be construed as necessarily reflecting the views or indorsement of the War Department.—The Editors.



TRAY DEHYDRATOR. Another type of experimental drier used to produce potato granules at Kansas State College department of chemical engineering.



POTATO CELLS in dehydrated granules. Rupture of cell has liberated free starch.

From Dehydrated Granules

from granules produced by successive freezing, centrifuging, dehydrating

is dry enough to be granulated through a screen. Evaporative dehydration often results in uneven drying, and the brittle material so produced receives abrasive action that ruptures the cells upon granulation.

This partial drying before granulation has previously been carried out in various manners. One process is based on the return of dried granules to freshly cooked and mashed potatoes. This requires, on the average, the subjection of every particle of potato to six passes through the drier with intermediate reconstitutions. The capacity of the granule drier is reduced proportionately by this recirculation of dried material, and drying costs are increased. Other methods propose the use of vacuum drying, which is one of the more expensive methods of drying material.

The new process embodies the principle of squeezing the moisture out, a procedure made possible by the freezing step of the process. Any potato which is thawed from a frozen state has a tendency to release contained moisture. Water will readily flow from the potato when it is squeezed in the hand. The application of slightly greater pressures lowers the moisture content to such a degree that the material can be satisfactorily granulated.

Continuous Process

The process is continuous, thus conforming to the best economic design of a vegetable dehydration plant. Raw potatoes from storage are washed, peeled, trimmed, sliced into ¾-in. slices, cooked, frozen, thawed, partially dried by pressure at this stage—removing 50 percent of total moisture—granulated through a screen, and flash dried in a hot air stream.

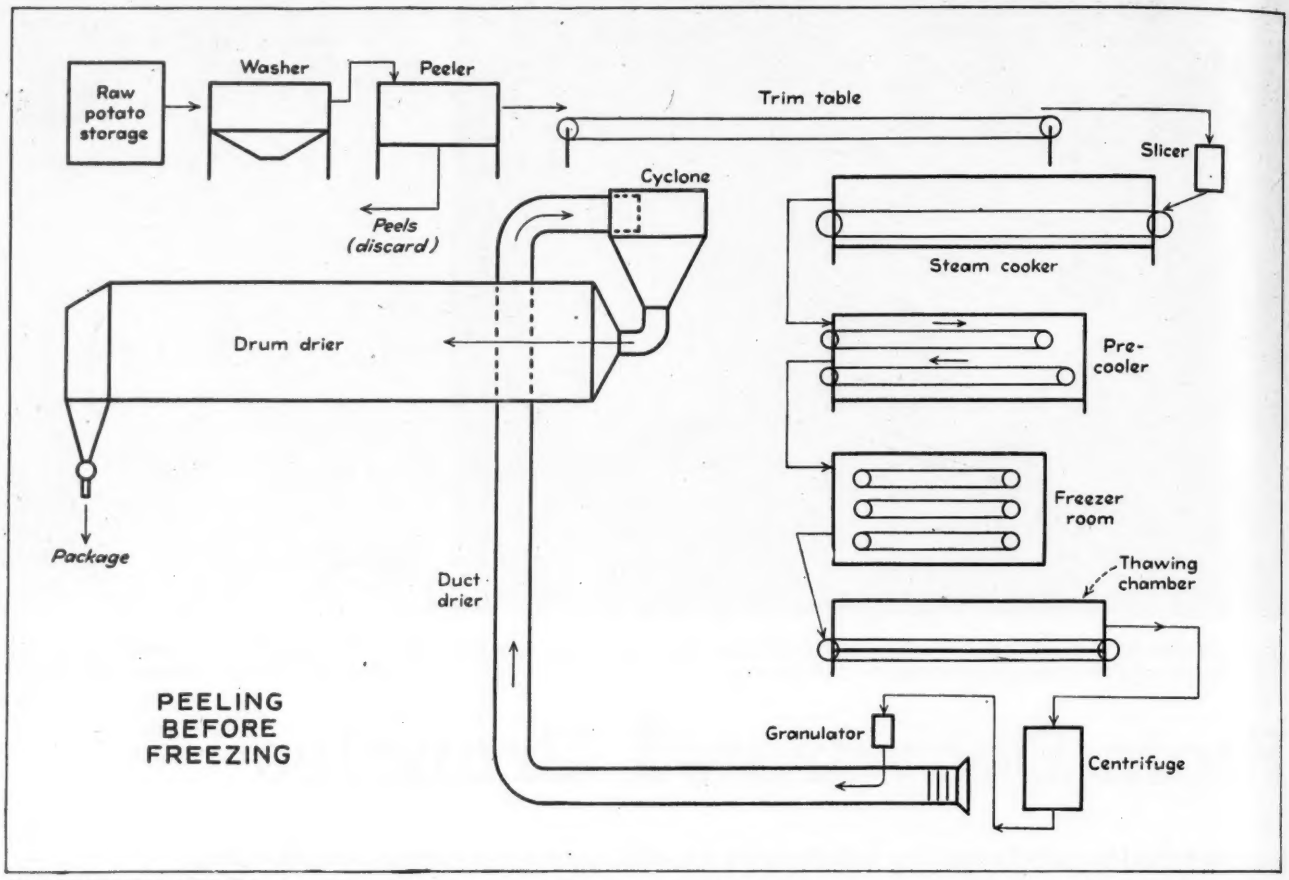
A variation possible in the above flow sheet makes the process capable of increasing yields by salvaging potato pulp losses and by eliminating hand trimming—a radical departure in processing root vegetables and remarkably low in terms of production cost. This variation is optional to the process and will be discussed below, since it changes the handling method of preparation only and does not affect the fundamentals of the process.

Washing, peeling, and trimming are accomplished by any choice of the standard methods now in use. Large potatoes, if used, would then be sliced to a thickness of approximately ¾ in. to facilitate subsequent heat transfer operations—cooking, freezing, and thawing. Small potatoes would not be sliced. The slices are cooked approximately 30 min. at 210 deg. F. in a continuous, atmospheric pressure, steam cooker. The only requirement is a thorough, proper cook. Proper cooking is a necessity, as under- or over-cooking has a tendency to rupture cells and to reduce the amount of moisture removable by pressure in the partial drying step. Water cooking causes severe strain to the cells and is to be avoided.

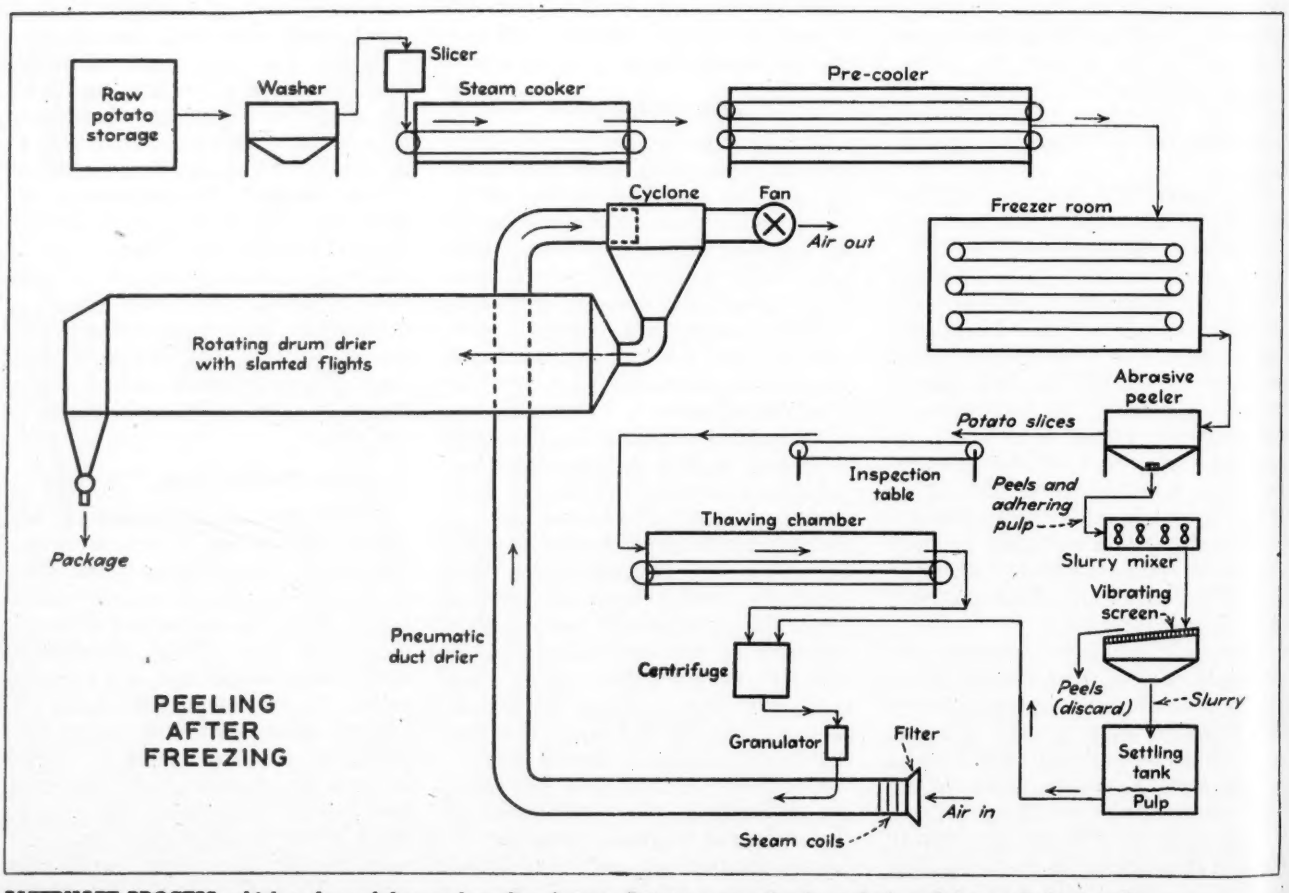
Slices Frozen Then Thawed

The cooked potato slices are then frozen until solid. Slices flow from the cooker into a continuous freezer or freezing room. It is only necessary that a temperature of approximately 25 deg. F. be maintained until the materials are frozen solid. Freezer size, to handle the volume necessary for a commercial plant, is not prohibitive as might at first be expected. Floor space, amount of equipment, and equipment costs are minimum and economical for this type production plant. Proper plant layout would

Raw Potatoes Are Converted to Dehydrated Granules in a Continuous Operation



CONVENTIONAL METHOD for production of Instant mashed potato granules by the use of peeler and trim table. Potatoes are then sliced, cooked, frozen and thawed. Fifty percent of the moisture is removed mechanically. Granulating follows, then drying.



ALTERNATE PROCESS which reduces labor and peeling losses. Potatoes are sliced, cooked and frozen before peeling.

Instant Mashed Potato Granules Reconstitute Easily, Have Excellent Shelf Life

GRANULES are converted to fluffy mashed potatoes when added to boiling water

TABLE I—PRODUCTION COST—Instant Mashed Potato Granules.

		Cost per pound dollars
Potatoes		
$0.75 per cwt., ratio of 5.5 to 1		0.04
Production Cost		
Personnel (management and labor)	$.025	
Utilities	.01	
Operation expenses and general overhead	.005	
Amortization	.0075	
Packaging (materials and labor)	.02	0.0675
Production profit		0.0225
Total cost		0.13

include a pre-cooling step to dissipate cooking heat; this can be as simple as a cooling tunnel equipped with a continuous conveyor. The potato slices from the cooker will be at a temperature above 200 deg. F., and should be reduced to somewhat below room temperature before entry into the freezer itself.

The freezing step is not to be confused with the commonly known "quick-freezing." It is, in fact, the opposite of quick-freezing. The structure of the potato and of its starch-bearing cells is altered by freezing into that necessary for processing, and the formation of this proper structure does not take place if the freezing is too rapid, tending instead to remain the same. Although the cell membrane would be toughened by quick freezing—one of the reasons for freezing—the ability of the potato to release moisture by pressure would be lost, thus preventing the necessary partial drying step that follows.

Freezing Rate Important

Although the rate of freezing is important, quality is apparently not affected by the length of time potatoes are held in the frozen state. Numerous tests indicated no difference in the property of potatoes held for only a few minutes compared with those held up to 30 days.

Thawing the frozen slices as they leave the freezer is accomplished by circulating warm air over them. It must be remembered, however, that just as cooling will toughen the cell membrane, thawing too rapidly will soften the cells and render them more susceptible to rupture damage throughout the rest of the process. The use of too much heat to effect thawing will result in too quick a thaw, reversing the action performed by freezing, and the potato will revert to its original structure. The thawing operation is simplified by heat interchange—cooling the cooked mass and warming the frozen mass by counter flow.

Drying and Granulating

The partial drying, to which the material is next subjected, was discussed above. It is accomplished mechanically by the application of pressure to the thawed potato pulp. Either a press or a centrifuge may be successfully used; the centrifuge is probably better from a plant operational viewpoint. Water readily flows from the potato, and low pressures not to exceed 50 psi. or equivalent gravities will suffice. This pressure does not make it a cumbersome or extensive operation. Half the total moisture is hereby removed.

Granulating the material from the centrifuge is done by paddling it through a mesh screen. Several commonly known types of food machinery can be used, with slight modifications, for this purpose. The finely divided product drops from the granulator into the dehydrator, where it receives final drying.

The dehydrator need be nothing more than an air-stream duct through which the granules are blown for almost instantaneous drying and collected in a conventional cyclone collector, a rotary air (drum) drier, or a combination of the two. Experimental tests have proved the ideal workability of the rotary drum drier, and provide the key to successfully obtaining low moisture contents with insignificant cell rupture.

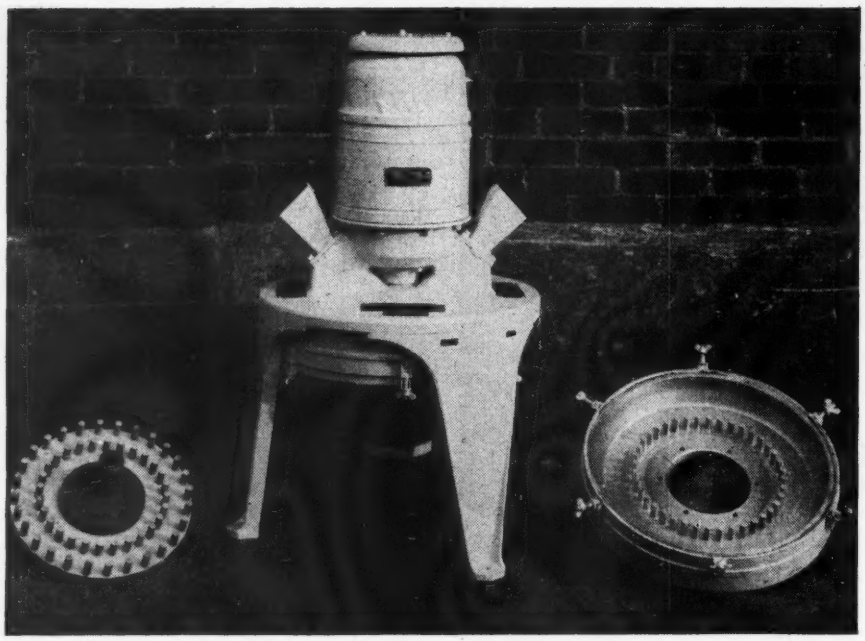
Cell rupture can be a problem in final drying because the granules become progressively dry and brittle. Abrasion in such a state will rupture cells, whereas the basis of this process is the successful preservation of this cell structure. Moisture contents to 3 percent were reached, while keeping cell rupture to as low as 2 percent, by use of a drum drier. A normal rupture of 6 to 12 percent in the finished product can be tolerated without obtaining an inedible, pasty product.

A variation in the flow sheet of this process, mentioned in an earlier part of this article, makes possible a radical departure from the standard method of hand-trimming potatoes. The trim table and with it a percent of total production cost, can be eliminated. The ratio of raw material used per pound of finished product can also be materially reduced by salvaging the normal peeling losses, with a further economy in production costs.

Revised Flow Sheet

In the steps of this revised flow sheet, raw potatoes from storage are washed but not peeled, sliced into ¾ in. slices, cooked and frozen solid. This preparation is the same as before with one exception—the peel is left on throughout cooking and freezing. Coming from the freezer, the solid slices are peeled and trimmed mechanically by subjecting them to slight abrasion and simultaneous water spray. The slight abrasive action is sufficient to remove the jackets, which have been characteristically loosened by freezing, and the water spray helps by slightly thawing the outside surface. The peeler for this purpose can be almost identical to a rotary washer, as used for root vegetables. The tumbling action herein received gives the necessary abrasion, while the water spray does the outside thawing necessary. The frozen po-

(*Continued on page* 213)



IMPACT MACHINE has few parts. Rotor (left) has two concentric rows of impactors. Liner (right) has 28 stationary impactors. Picture shows two spout connections. Standard or modified Entoleter units may be used in the milling of flour.

Important Development

FOOD INDUSTRIES presents here one of the first of several new applications of the "Entoleter" centrifugal machine. Entoleters were introduced by the Safety Car Heating and Lighting Co., Inc., New Haven, Conn., originally for the control of insect infestation.

Following the development of this equipment, it was apparent that the impact principle may have wide application in the process industries for grinding and reduction. In the case of flour milling, the work has now reached the point of practical application. The data given here are the first to be released on the use and results of impact milling.

Among advantages in prospect are improved sanitation, reduced expense for milling equipment, lowered power consumption, economies in maintenance of the mill machinery. Changes in the flour and in the mill operation are fully presented in the article.—The Editors.

"Impact" Flour Milling

Centrifugal impact machines, hitherto used for controlling insect infestation, may be used along with roller equipment in regular flour milling operations

By A. N. HIBBS, J. A. SHELLENBERGER and R. O. PENCE
Kansas Agricultural Experiment Station, Manhattan, Kansas

IMPACT action, one of the first principles applied in making flour, may again be used to advantage in the milling process. This possibility is an outgrowth of the development of centrifugal impact machines for control of insect infestation. These centrifugal machines (or Entoleters*) have definite value—and also some limitations—in the milling process itself. They may be used alone or in combination with the usual break rolls.

A study of impact machines for flour milling has just been concluded in the department of milling industry at Kansas Agricultural Experiment Station, where the Entoleter machines were installed in the 130-sack experimental flour mill. The flow of the mill was adjusted to permit the substitution of Entoleters for break rolls throughout the system. With these adequate facilities for comparing milling methods, the factors affecting the reduction of material by impact machines were studied and ways sought to use them to advantage in the milling process. The results of the tests were reported in this article.

The use of impact goes back to prehistoric times, when seeds were crushed by stones held in the hand. There has, however, been little incentive to improve impact milling methods in recent years, owing to the widespread use of rotating mill stones and the development of steel rolls.

An impact grinder was demonstrated in Paris in 1878. In 1921, Kozmin[1] discussed impact machines but concluded that they were inefficient and produced endosperm contaminated with fine bran. The theory of impact grinding is developed in an article by Hibbs, Shellenberger and Pence.[2]

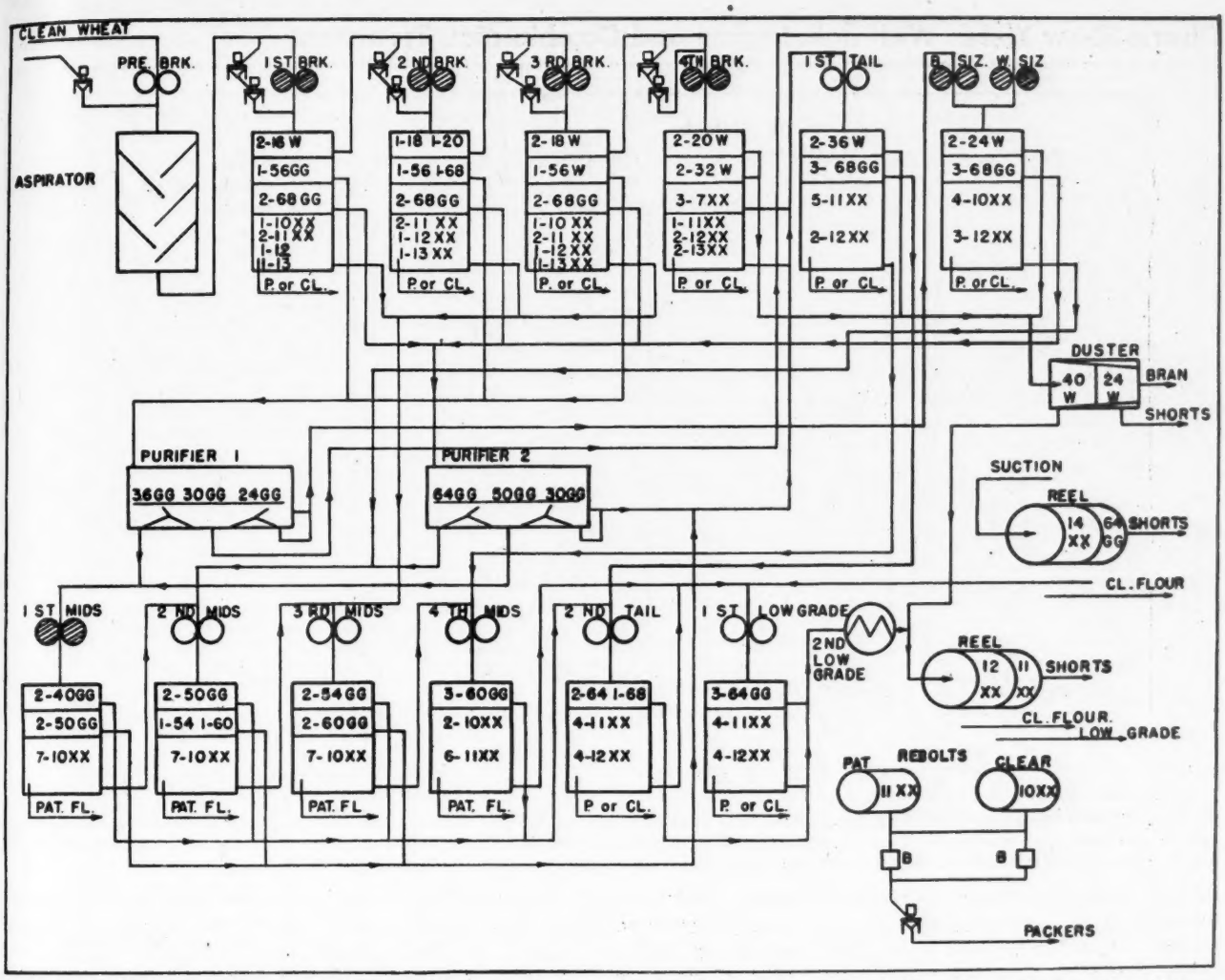
In the work at Kansas State College, experiments were conducted to determine the effects of rate of feed, types of stock, condition of the material and the type of machine upon the reduction obtained. After determining the factors affecting the reduction of material by impact machines, tests were made to determine how to integrate these machines into the milling process. The physical characteristics and the quality of the products produced by impact machines were compared with those products produced by rolls.

Materials and Methods

Number one hard red winter wheat was used in this investigation. The experiments on physical characteristics and quality were done with wheat having a test weight of 60.5 lb. per bushel, a moisture content of 11.6 percent, 13.2 percent protein and 1.76 percent ash.

The wheat received identical cleaning treatment in every case before milling. The cleaning equipment used included a milling separator, Iron Printz scourer and

*Trademark of the Safety Car Heating and Lighting Co., Inc.



FLOW DIAGRAM shows where the Entoleter machines were installed in the 130-sack experimental flour mill at Kansas State College.

wheat washer. The wheat was tempered to various moisture levels by the Thomas, Stone and French wheat conditioner.

The flow of the mill is shown in the diagram. Samples for analysis were obtained below each grinding machine, while the mill was in operation. After the mill was allowed to "warm up," the individual flour streams were sampled when the milling operation had become balanced.

Experimental

The influence of the condition of the stock on the reduction produced by impact machines was studied thoroughly. In the processing of wheat by rolls each machine is capable of adjustment in order to provide optimum treatment of the product. No direct adjustment of the amount of reduction was possible with the Entoleters. Thus the influence of the amount, type and condition of the material entering the machine had to be investigated in terms of the amount of reduction accomplished. The following conditions were studied:

Rate of Feed. To determine the effect of the rate of feed on reduction, wheat tempered to different moisture levels was fed into the machine at various rates. The reduced product was then sifted over a number 18W sieve. The results show that when the rate of feed was sufficient to overload the machine and slow the moving impactors, extraction was reduced. When, however, the rate of feed was from three to 20 lb. per minute, the amount of reduction remained nearly constant. The rate of feed used in subsequent experiments was approximately 10.6 lb. per minute at the head of the mill.

Type of Material. To determine the amount of reduction produced on different types of material by an impact machine, whole wheat and second break stock were reduced and sifting tests were made. Typical results showed that whole wheat is reduced less in one operation than is second break stock.

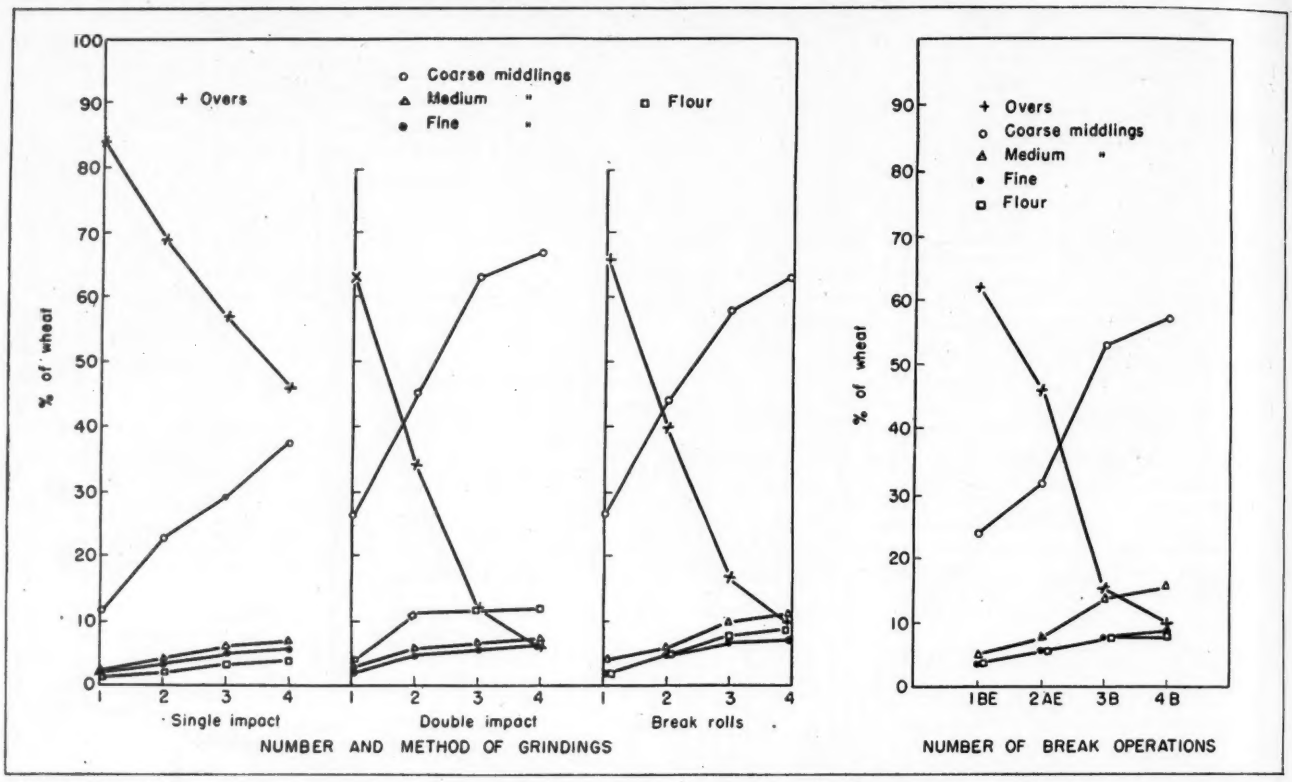
Moisture Content and Tempering Time. Wheat is normally conditioned before processing to toughen the bran coat and mellow the endosperm. Accordingly, the influence of moisture content and tempering time on the amount of reduction produced by Entoleters was studied.

Samples of wheat tempered from 11.3 to 24 percent moisture levels and allowed to rest for various periods of time were then reduced by impact action. The results showed that the overs of a number 18W sieve amounted to 73 percent for wheat of 11.3 percent moisture content. The amount of reduction varied inversely with the moisture content. At the 24 percent moisture level, 94 percent of the material remained over a number 18W sieve. The results for a 4-hour and 22-hour tempering time were similar. The tempering time at an 18 percent moisture level had little effect on the reduction even when the time was varied from 2 to 25 hours.

Utility of Impact Machines In the Break System

Reduction Obtained. To compare the grinding effect of impact machines with that of break rolls, each break roll was replaced by one impact machine (E), and the material obtained following each reduction was sifted. The results in-

Charts Show Yields With Roll, Impact and Combination Treatment



COMBINATIONS of equipment can produce almost any desired result in the mill. Chart 1, left, shows yields of ground products using impact machines and break rolls. Chart 2, right, shows influence of a combination of impact grinders and rolls on stock produced in the break system. First and second breaks (1 BE and 2 AE) employed impact grinders; third and fourth (3 B and 4 B), regular rolls.

dicate that after four operations, 46 percent of the material was retained over a No. 18 wire sieve. The scalp sieves used in these millings were numbers 16W, 20W, 16W, and 18W.

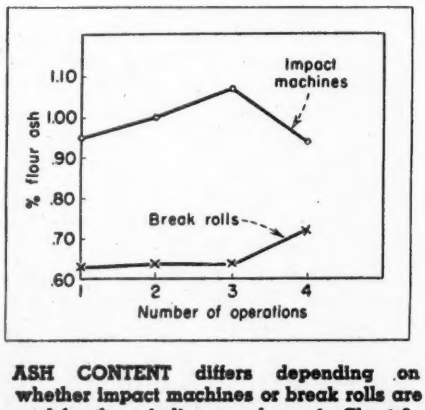
To increase the reduction, two impact machines (EE) were substituted for each break roll. The impact machines in series nearly duplicated the break rolls in the amount of reduction produced, but the appearance of the middlings separations indicated that the impact machine produced more fine bran fragments than did the rolls.

The distribution of mill fractions produced by each grinding method in the break system is shown in Chart 1. One impact machine in each operation did not reduce the material sufficiently if the action of the roll system is taken as a standard of comparison. When two impact machines were operated in series, however, the extraction approached that obtained by the break rolls.

More break flour and coarse midds were obtained when using the impact machines. The fine fractions contained considerable bran, which was highly undesirable. The coarse scalp sieves used allowed large particles of endosperm to pass through the purifiers while at the same time small fragments of bran also passed through the coarse sieve openings. The impact machines did not clean up the bran thoroughly, and thus considerable endosperm was scalped off into the bran.

Chemical Analyses of Break Flours Produced. Chart 3 shows graphically the relation between the number of grinding operations and the ash content of the break flour produced. It is evident that an excess of bran in the break flour was produced by impact machines.

Granulation of Break Flour Produced. To detect any noticeable differences in the granulation of the break flour produced by rolls and impact machines, the Roller Air Analyzer* was used. The particle sizes were separated by employing air velocities which exert sufficient force on the area of a particle of a specified size to lift it out of the sample, thereby obtaining particle size fractions. To function accurately all particles must have the same specific gravity and physical characteristics. This is not the case with break flour samples because the bran chips are flat and narrow, thus exposing more area than the pieces of endosperm. For comparative purposes, however, the errors resulting from this source are probably negligible.



ASH CONTENT differs depending on whether impact machines or break rolls are used for the grinding, as shown in Chart 3.

The results indicate that the flours produced were about the same granulation. Forty-three percent of first break roll flour and 47 percent of second break roll flour were from 0 to 36 microns in size while 40 percent of the 1EE (first impact machine) flour and 45 percent of 2EE (second impact machine) flour were in this particle size range.

Chemical Analysis. In Table I are shown the comparative results of the chemical analyses of the various mill streams when impact machines and break rolls are used in the break system. The ash and

*Manufactured by American Instrument Company, Silver Springs, Md.

Composition of Products in the Mill Streams in Tabular Form

TABLE I—Average chemical analysis of mill streams obtained from rolls and impact machines in the break system.

Sample No.	Treatment	Moisture content %	Ash content %	Fat content %	Fiber content %	Protein content %
Wheat	Wheat	16.0	1.50	1.17	4.12	10.85
1	1st break stock	15.9	1.63	1.16	3.50	11.0
2	Thru 1st break roll	16.6	1.56	1.21	3.09	10.7
3	2nd break stock	15.4	2.02	1.68	3.35	12.5
4	Thru 2nd break roll	15.4	2.46	1.72	3.61	12.8
5	3rd break stock	15.4	3.74	3.35	5.14	14.5
6	Thru 3rd break roll	15.0	3.08	3.53	5.47	14.4
7	4th break stock	13.5	5.76	4.54	6.66	14.9
8	Thru 4th break roll	13.5	6.05	4.83	8.47	15.0
9	Sizings stock	15.1	0.39	0.15	1.57	10.1
10	Thru sizing	15.4	0.39	0.42	1.62	10.1
11	1st tailings stock	14.1	1.66	2.93	3.58	11.6
12	Thru 1st tailing	14.2	2.01	1.90	3.00	11.7
13	1st midds stock	14.4	0.45	0.48	1.38	9.9
14	Thru 1st midds	14.7	0.45	0.53	1.33	9.9
15	Bran (rolls)	13.6	4.28	5.08	8.00	14.6
16	Shorts	11.6	2.38	5.07	5.54	15.6
17	Flour	13.5	0.48	0.63	1.23	10.3
20	1st Ent.* stock	15.9	1.51	0.67	2.49	10.8
21	Thru 1EE	15.9	1.54	0.84	2.56	10.8
22	2nd Ent. stock	15.8	1.68	0.96	2.76	11.2
23	Thru 2EE	15.4	1.73	1.51	2.84	11.2
24	3rd Ent. stock	15.1	1.76	1.54	2.89	11.8
25	Thru 3EE	15.2	2.24	1.44	3.28	11.5
26	4th Ent. stock	15.0	2.16	1.21	3.01	11.5
27	Thru 4EE	14.6	2.82	1.97	4.28	12.1
28	Thru 4th break roll	14.7	3.18	2.03	4.28	12.2
29	Sizings stock	15.4	0.46	0.34	1.19	9.9
30	Thru sizings	15.1	0.38	0.32	1.58	9.9
31	1st tailing stock	14.4	1.43	1.39	3.34	11.2
32	Thru 1st tailing	13.7	1.45	1.41	2.88	11.0
33	1st midds stock	14.6	0.43	0.37	1.28	10.0
34	Thru 1st midds	14.7	0.47	0.41	1.71	10.1
35	Bran	13.6	5.56	5.27	9.17	15.7
36	Shorts	11.6	6.29	3.93	5.84	13.6
37	Flour	13.3	0.53	0.44	1.97	10.2

*Impact machine.

TABLE II—Effect of different type break machines on wheat at 16 percent moisture level.

Treatment	Overs 16W %	Overs 56GG %	Overs 70GG %	Overs 11XX %	Throughs 11XX %
Break rolls	71.6	20	3.8	2.3	1.7
2 standard milling impact machines in series	64	25.5	3.5	2.5	4.5
1 Impact Machine A.	70	17.1	2.1	1.8	2.2
1 Impact Machine B.	60.9	28.8	4.0	3.0	2.7

PHYSICAL CHARACTERISTICS: The standard impact machines, operating two in series, reduced the bran more than did the rolls. This resulted in smaller pieces and greater quantities of bran in the sizings, middlings and flour separations. On the other hand, the impact machines did not reduce the endosperm as much as did the rolls. As a result, large portions of endosperm were carried over to the tail of the break system. This is undesirable because material from the tail of the break system usually goes to streams of inferior quality.

TABLE III—Characteristics of flour streams obtained using break rolls in comparison with flour produced by a combination of impact machines and break rolls in the break system. Wheat tempered to 16 percent moisture.

Mill stream	Original wheat %	Moisture %	Ash %	Protein %	Crude fat %
		Break system: Rolls only			
1st break	0.4	13.7	0.58	11.0	0.85
2nd break	1.0	14.7	0.53	12.0	0.75
3rd break	0.9	14.4	0.50	13.8	0.84
4th break	0.7	13.6	0.86	16.0	1.19
1st tailings	2.6	13.2	0.65	13.3	0.74
2nd tailings	2.7	12.4	0.63	11.5	1.25
Sizings	4.1	14.7	0.48	11.1	1.03
1st midds	11.3	14.3	0.43	11.4	1.03
2nd midds	13.2	14.1	0.38	11.3	0.98
3rd midds	7.0	13.6	0.41	12.2	0.99
4th midds	5.8	12.8	0.42	12.1	0.91
5th midds	6.3	12.2	0.55	12.2	1.03
Rebolt roll	7.6	12.7	0.68	12.5	1.46
		Break system: Impact machines and rolls			
Impact 1BE	1.3	14.0	1.09	14.7	1.00
Impact 2AE	1.2	14.1	1.15	14.7	1.25
3rd break	0.8	13.5	0.70	12.6	1.00
4th break	0.6	13.2	0.85	15.6	1.40
1st tailings	3.0	13.4	0.67	14.0	1.05
2nd tailings	1.8	12.8	0.58	11.7	0.93
Sizings	8.2	14.1	0.49	11.8	0.90
1st midds	11.2	14.0	0.46	11.5	0.97
2nd midds	16.3	13.8	0.39	11.2	0.83
3rd midds	9.1	13.5	0.53	13.0	0.89
4th midds	7.5	13.0	0.44	12.0	0.90
5th midds	5.8	12.7	0.53	12.3	0.90
Rebolt roll	7.7	12.4	0.75	12.7	1.35

TABLE IV—Comparison of stock in the reduction system when using different grinders in break system.

Mill stream	Original wheat %	Moisture %	Ash %	Protein %	Crude fat %
		Rolls (16% moisture wheat)			
1st midds	25.2	14.9	0.51	11.5	1.09
2nd midds	31.8	14.6	0.46	11.6	1.04
3rd midds	19.3	14.4	0.49	12.1	1.12
Sizings	29.0	15.3	0.52	11.9	0.81
Brown sizings	14.2	15.1	1.42	12.1	1.77
1st tailings	11.3	14.2	1.24	13.4	1.80
2nd tailings	9.3	13.4	1.06	12.3	1.83
		Impact Machines (16% moisture wheat)			
1st midds	35.2	14.6	0.55	11.4	0.92
2nd midds	33.2	14.3	0.49	11.7	1.03
3rd midds	23.8	14.3	0.62	12.8	0.92
Sizings	26.5	15.3	0.75	11.9	0.89
Brown sizings	30.8	15.3	1.71	12.5	1.98
1st tailings	20.8	14.0	1.55	12.8	1.94
2nd tailings	19.0	13.5	1.18	12.7	1.67
		Combination impact machines and rolls (17.4% moisture)			
1st midds	34.5	15.1	0.64	11.8	0.84
2nd midds	37.7	14.7	0.52	11.6	0.76
3rd midds	22.3	14.6	0.66	12.7	0.93
Sizings	40.3	15.6	0.64	11.4	0.38
Brown sizings	24.8	15.6	1.98	12.4	2.00
1st tailings	16.4	14.3	1.87	13.4	2.42
2nd tailings	10.2	13.5	1.54	12.9	2.03

fiber content are higher in most cases when impact machines have been employed. On the other hand, the protein content of the streams did not show definite trends caused by the breaking system used in the experimental mill.

Baking Quality. The straight grade flours produced were baked and all showed similar baking characteristics. The bread obtained from the flour made by the impact method had slightly larger volumes, but in all other respects the results were the same as with flour made with roller mills.

Other Types of Multi-Stage Impact Machines

Other multi-stage grinders were tested in addition to standard impact machines. Type A was a machine containing 40 stationary impactors instead of 28. Type B machine was designed for higher extraction. It consisted of an additional row of stationary impactors on the inside of the first set of rotating impactors.

Reduction Produced. Grinding operations performed by different impact machines and rolls were tested by grinding wheat and separating the products by sifting.

The performance of these machines in terms of grinding efficiency, as estimated by separation of the ground wheat products, is shown in Table II. The 40 stationary impactor machines (A) produced about the same extraction as the normal first break rolls. The machine that employed two rows of stationary impactors (B) produced about the same extraction as two standard impact machines in series.

When impact grinders were used, there appeared to be too

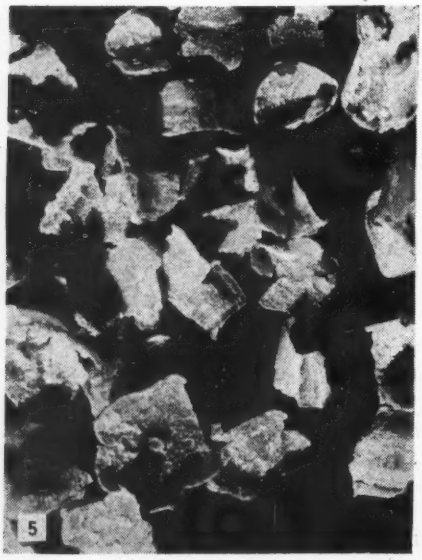
Products of the New Milling Method

Shows stock from the first break rolls.

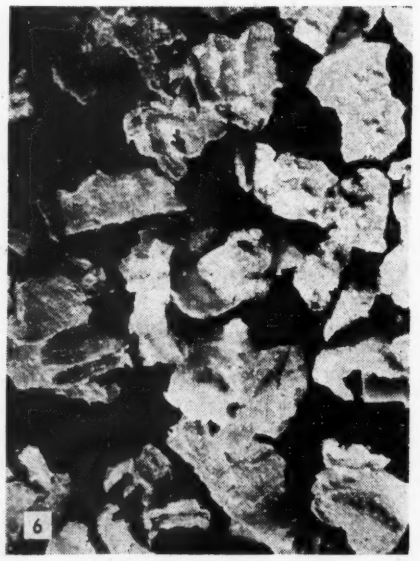
First break stock from impact machines.

Bran from break roll milling system.

Bran from impact milling system.



Two types of impact machines—bran from combination of type "A" and "B" machines.



Combination equipment—bran from type "A" and "B" impactors and break rolls.

much good stock at the tail of the break system. Normally it is good milling practice to remove most of the middlings from the bran before it reaches the fourth break rolls. To get the maximum impact breaking effect and to remove most of the endosperm from the bran before it reaches the fourth break, a combination of impact Entoleters and rolls was used in the break system. Two impact machines, BE (type B together with the standard) were used in the first break. Two impact machines, AE (Type A and standard) were used in the second break. The normal third and fourth break rolls were used to reduce the large pieces of endosperm and to clean up the bran before it reached the tail of the break system. This resulted in a very high extraction in the first operation.

Chart 2 shows the reduction graphically and indicates that most of the endosperm is removed by the time the stock reached the fourth break rolls. For these operations the following scalp sieves were employed: 18W, 26W, 20W, and 18W. This resulted in cleaner fractions and a better balance of the mill. The chemical analyses are shown in Tables III and IV. Table III compares the break streams and Table IV compares the reduction system.

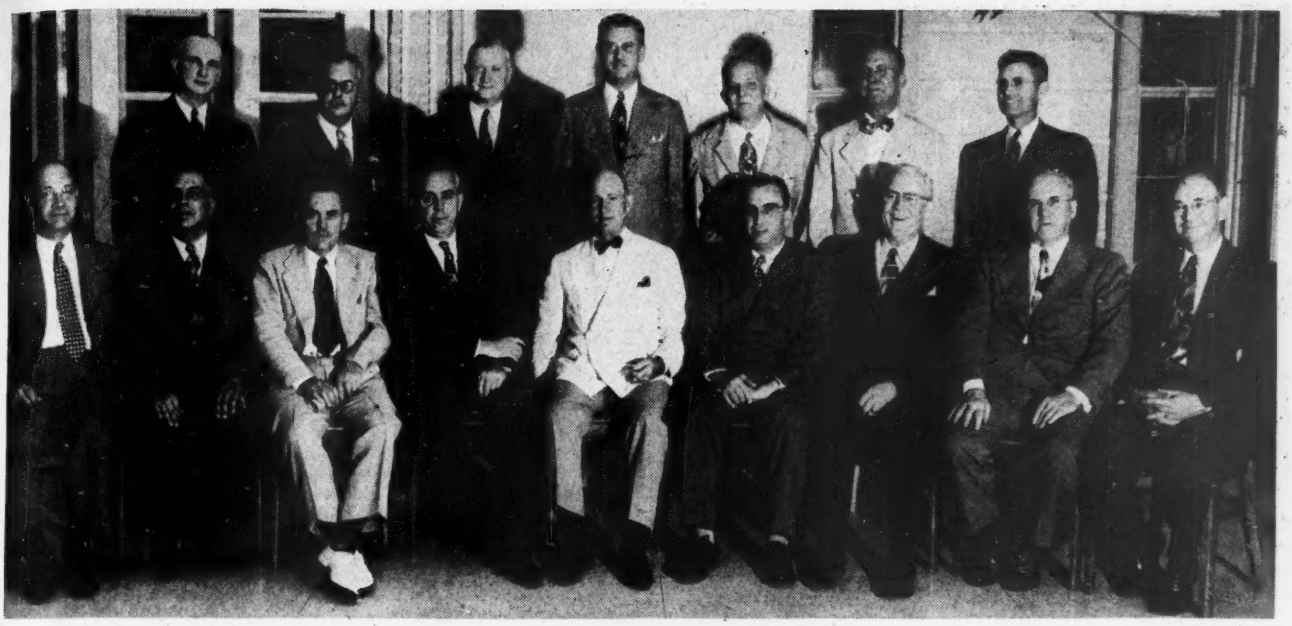
Crude Fat of Mill Streams as an Index of Germ Content. The differences in mill streams due to type of grinding were studied with particular reference to germ separation. Table III shows the relative amounts of the various mill streams produced with (1) conventional break rolls, (2) impact grinders and break rolls. The moisture, ash, protein and crude fat contents of the various streams are also shown in this table.

Variable Factors

Among factors affecting the reduction obtained from an impact machine are the size, hardness or extent of injury to the particle. The amount of reduction varies inversely with the moisture content of the material. Hard red winter wheat should be tempered to about 17 percent moisture content for satisfactory reduction by the impact grinders used in this study. The tempering time, however, within the range of from 2 to 25 hours did not affect the amount of reduction.

Definite changes in extraction were obtained when the working parts of the machines are altered.

(*Continued on page* 221)



DIRECTORS of International Association of Ice Cream Manufacturers meet. Standing, left to right: Bert Sweeting, Tacoma, Wash.; E. L. Walker, Los Angeles; Ridgway Kennedy, Jr., Philadelphia; R. P. Touton, Janesville, Wis.; G. A. Sancken, Augusta, Ga.; A. R. Nielsen, West Palm Beach; A. J. Claxton, Pittsburgh. Seated: Alfred Ricciardi, New York; S. C. Hookstratten, Whittier, Calif.; Claude Parcell, treasurer, Fredericksburg, Va.; R. C. Hibben, executive secretary; B. C. Brown, New Orleans, president; Hugh Hutchinson, Lewisburg, W. Va.; G. S. McKenzie, Los Angeles, vice-president; J. J. Hayes, Minneapolis; W. M. Hawk, Tulsa, Okla.

Dairy Industry Meets in Miami

Miami Beach is host to 43rd annual convention attended by over 1,500 IAICM members and associates. DISA, DISI and Milk Industry Foundation also meet

FOOD INDUSTRIES Staff Report

MERCHANDISING problems of supply and ways of working with personnel were some of the topics prominent on the program of the 1947 week-long convention sessions of the dairy industry at Miami Beach, Florida. Four organizations joined in the combined meetings, held late in October: The International Association of Ice Cream Manufacturers; the Dairy Industries Supply Association with its associate organization, the Dairy Industry Society, International; and the Milk Industry Foundation.

Dairymen, ice cream manufacturers and dairy equipment suppliers met in shirt-sleeves Florida weather for the inter-related conferences, which included three morning general sessions at the Beach Theater.

Prominent Speakers

Session one was devoted to greetings and reports from the International Association of Ice Cream Manufacturers and the Dairy Industries Supply Association, with addresses by William C. Foster, Under Secretary of Commerce, and by Quentin Reynolds, well-known author and commentator. Session two, under the auspices of the Ice Cream Merchandising Institute, Inc., was concerned with merchandising and personnel problems. At the third session, members heard committee reports and nominated association officers.

Following this initial three-session program, the Milk Industry Foundation ran off its three-day meeting, to round out the week of conferences.

Benjamin C. Brown, president of the IAICM and chairman of the first general session on October 27, opened the conference with a report of his stewardship. He informed the members of the services available from the IAICM and of the activities of the association in Washington. And Mr. Brown's words on the merchandising theme —"Should present business trends continue, the American ice cream industry will reach its peak during 1948 with 1,000,000,000 gal. of frozen dessert produced in a single year"—were echoed by a majority of the speakers.

Supply Industry

Following President Brown, Robert Rosenbaum, president of the DISA, reported on conditions in the supply industry. He said that heavy trucks are available 30 to 60 days after they are ordered. Medium trucks for wholesale delivery of milk and ice cream mean a 6-months' wait, while light delivery trucks are almost as hard to get as passenger cars.

Storage tanks, said Mr. Rosenbaum, entail a 10- to 12-month wait; homogenizers, 3 to 6 months; freezers too are in great demand. Delivery on ice cream cabinets and soda fountains is very slow.

Flavors for ice creams are also a supply problem. Vanilla is available at present but conditions are

CONVENTION headquarters open. IAICM Pres. B. C. Brown, complete with yachting cap, is greeted by Hospitality Chairman E. C. Fogg, Jr., in the aquatic shirt.

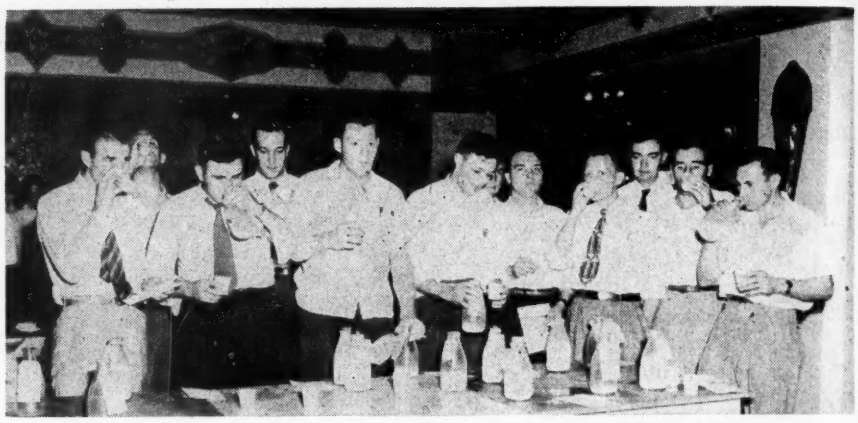
WARNING from W. C. Foster, Under Secretary of Commerce—ice cream manufacturers hear that "world totalitarian forces await economic collapse of the U. S."

not good in Madagascar, biggest vanilla producer; the situation suggests a scarcity of vanilla beans next year. Chocolate supply is limited, due to tree diseases. Fruits and nuts are plentiful but costly.

William C. Foster, Under Secretary of Commerce, continued the first session of the convention. Addressing IAICM members, he warned that world totalitarian forces await the economic collapse of the United States to seize power, and said "the fate of many countries and their hopes for economic revival rest in our hands." For even though European countries are now producing almost at prewar levels, the scale of the war's destruction has made catching up impossible.

Quentin Reynolds, author and commentator, was the principal speaker at the afternoon meeting of the first session, as well as narrator of the IAICM report for the past year. Mr. Reynolds injected a word of warning when he pointed out the possible effect of the government's food conservation program on ice cream consumption. He called attention to the location of ice cream at the bottom of most menus as an indication that everyone does not consider it a food.

SPEAKERS at first Production and Laboratory Council include, left to right, Prof. I. A. Gould, University of Maryland; Dr. D. V. Josephson, Ohio State University; Walter Ahlstrom, chairman; Prof. W. H. E. Reid, University of Missouri; Dr. H. D. McAuliffe, director of research, Bowman Dairy Co.; Dr. C. D. Dahle, Pennsylvania State College.



STUDENTS judge dairy products in contest sponsored by Dairy Industry Society, International, and American Dairy Science Association. Winner receives $850 fellowship.

CHEESE authorities are C. J. Babcock, left, chairman of Students' Judging Contest, and Prof. C. M. Trout of Michigan State College.

FAMED author, lecturer and commentator, Quentin Reynolds, delivers "Your Report" to assembled ice cream manufacturers.

James D. Shouse, president of the Crosley Broadcasting Co., Cincinnati, gave the second address. Speaking of the publicity and advertising opportunities for ice cream manufacturers, Mr. Shouse pointed out that while there were a few more than 600 broadcasting stations before the war, there are now 1,600 AM and 900 FM licensed stations in operation today.

The second general session opened on Tuesday morning, October 28, under the auspices of the Ice Cream Merchandising Institute, Inc. The first speaker was Gordon Cook, editor of Cook Publications, New York. His title was "There's Clover in Turnover." Connected with the dry grocery field for many years, Mr. Cook said that the dry grocery field now is profitless, or nearly so, and that the profit items are the perishables. The trend,

SAILING, from left to right: Ridgway Kennedy, Jr., Abbott's Dairies, Philadelphia; "Admiral" Benjamin C. Brown, Brown's Velvet Ice Cream Co., New Orleans; Sam H. Solomon, Solomon's Dairies, Quincy, Fla.; Robert C. Hibben, IAICM executive secretary. No landlubbers either are Mrs. Kennedy, Mrs. Hibben, Mrs. Solomon.

THE PRESIDENT receives. President Brown (without his cap) shakes hands with Mr. Meyers of Meyers Dairies, Kansas City, Kan., at reception in garden of Shelborne Hotel. At Mr. Brown's right are G. S. McKenzie, IAICM vice-president, and Mrs. J. Owen Bowen, chairman of the ladies' hospitality committee.

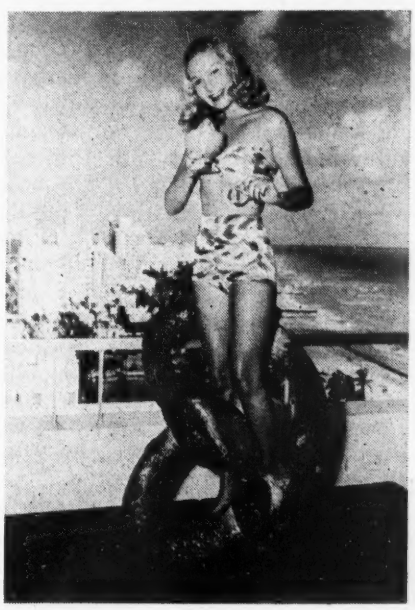
then, in the grocery field is to perishables. Mr. Cook predicted, however, that it will be five years before the grocery industry hits its stride in the perishable market. It will probably be 1950 before the supply of refrigerated cases is ample. Any large increase in ice cream sales must come through grocery outlets; in fact, the groceries may become the primary outlet.

Mr. Cook cited a number of chains—among them the Safeway chain in the West and A&P in Milwaukee and Detroit—that make their own ice cream. Other large chains—American Stores in Philadelphia, Grand Union in New York, First National in New England—buy from established manufacturers. Mr. Cook gave statistics on sales of highly advertised products versus larger profit, little known brands, to influence ice cream manufacturers to maintain quality and to establish their names with the public. He pointed out the need for selling the chain store manager on the product—the manager is more important than the top executives in developing and continuing sales.

Dr. Samuel N. Stevens, president of Grinnell College and vice-president of The Personnel Institute, Inc., New York, spoke on "Changing Pints Into Quarts." The pints and quarts are a company's employees.

Most executives have taken human problems for granted, and consequently 90 percent of labor trouble is home-made, it was indicated. Management has been unwilling to apply the same methods to labor as to plant and product, according to this spokesman for the Personnel Institute, and machines have often been more important than men. The average human being rarely spends more than 30 percent of his available energy on his job. The greatest responsibility of management is development of man power.

Third speaker of the second session was A. J. Claxton, vice-president of the Meadow Gold Dairies, Pittsburgh. His talk, "You Have To Make a Profit," also dealt with the human element—the sales force. The points he stressed were: (1) Hire good men and appeal to their good points, (2) give a man a job he can do, (3) have a stopping point at which a man can be praised for good work or shown his shortcomings and mistakes, (4) give men of different ability a chance to shine, (6) assign a quota—an immediate quota and an ultimate quota, (7) help your men—blueprint the job.



WHERE'S the ice cream? Look closely (if any urging is necessary) and see Rae Stratton of Miami Beach chasing hers with a pretzel.

Production Meeting

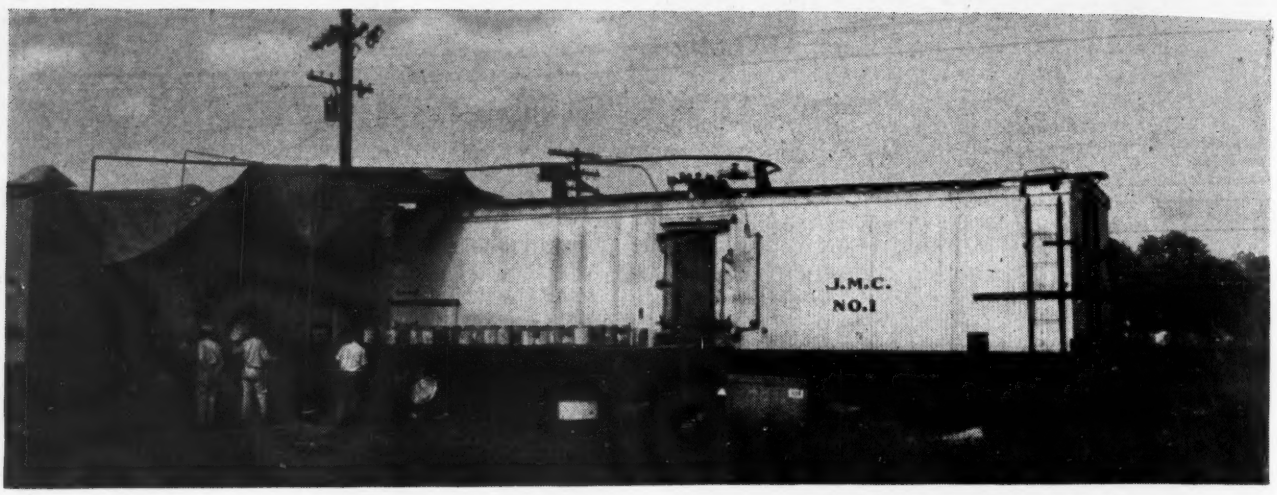
As is always the case at this convention, the production and laboratory council meetings attracted wide attention. Monday afternoon's meeting, which filled to overflowing the meeting room at the Vanderbilt Hotel, was conducted under the chairmanship of Walter Ahlstrom, of the Carnation Co., Los Angeles, Calif.

Prof. W. H. E. Reid of the University of Missouri spoke on "The Use of Whey Solids in the Manufacture of Ice Cream." Dr. D. V. Josephson, of Ohio State University, described the human factors that enter into the "Evaluation of Flavor of Ice Cream." Prof. I. A. Gould, of the University of Maryland, talked on "Utilizing the True Lactic Acid Content to Indicate the Quality of Ice Cream."

Dr. H. D. McAuliffe, director of research, Bowman Dairy Co., Chicago, maintained in his talk on "Full Utilization of the Plant Laboratory" that there is no further excuse for offering the public an inferior ice cream. Dr. C. D. Dahle of Pennsylvania State College spoke on "Shrinkage in the Package." Dr. Dahle used figures from questionnaires he had sent to manufacturers throughout this country and Canada.

The afternoon production session, held on Wednesday, Oct. 29, was devoted to plant production problems.

(*Continued on page* 216)



TWIN CAR UNIT is placed on siding in single-crop area. Products are frozen in one car, then held at 0 deg. F. in the other car.

Mobile Freezer Aids Growers

Plant utilizes two railroad cars. One is a freezer and the other is a

By CHARLES F. ELLIS, Commerce Dept.
Tennessee Valley Authority, Knoxville, Tenn.

A MOBILE freezing plant has been designed and constructed by John M. Craddock of Transit Freezers, with the assistance of engineers of the Tennessee Valley Authority, to freeze products in single-crop areas and to extend the processing season to assure profitable operation. It can be moved about as the season progresses and as products in different localities become available.

Officials of the G M & O Railroad and Merchants Dispatch Transportation Corp. arranged for the necessary railway cars and equipment and established rates for siding rentals and car movements.

Handles Gluts

The mobile freezer was developed to serve localities producing large quantities of fruits or vegetables where freezing or other preserving facilities are not available. These areas are essentially dependent upon the fresh market which frequently cannot handle large crops or daily surpluses. Ordinarily, these crops are harvested over a comparatively short season, extending only a few weeks. Freezing plants could not serve these areas profitably because of the short operating season.

Despite operating with substitute equipment and makeshift arrangements for about a year, the operators are satisfied with the mobile plant's usefulness. Its mobility has enabled them to operate in the centers of several growing areas where quality fruits and vegetables were locally available. Consequently, they have been able to obtain harvest-fresh produce, avoiding losses in quality and weight attendant upon long distance haulage, and to freeze the produce at costs comparable with those of conventional plants.

The operators have gained considerable experience with the mobile plant. They have learned how to prepare products and handle them in and out of freezers. With an expected reinforcement of compressor capacity, they plan to expand their volume of freezing materially during subsequent seasons. They feel confident that the mobile freezer will produce quality frozen foods economically and provide growers with a firm market for their produce.

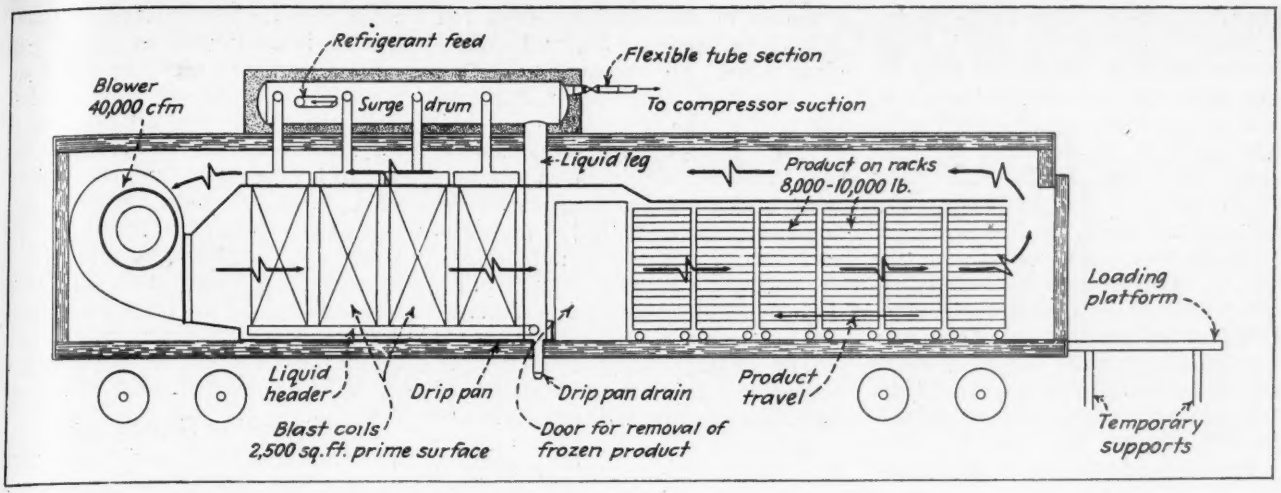
The plant consists of a freezing unit, a holding unit where the frozen product is held at 0 deg. F., and a machinery unit serving them. The freezing and holding units are built into conventional refrigerated railway cars which can be transported to any convenient railroad siding. The refrigerating machinery is mounted on a highway truck-trailer which can be parked near the freezing and holding cars.

Products are prepared and packaged in a nearby screened-in packing shed and taken directly to the freezing car. After the products are frozen, they are taken out of the freezer and stored in the holding car until enough has been accumulated for a shipment.

Construction Problems

The mobile nature of the plant presented a number of problems not usually encountered in the construction of a conventional stationary plant. A freezing capacity of 2000 lb. of product per hr. was required. Consideration had to be given to compactness in constructing a plant of the intended capacity with the available mobile units. Simplicity in arrangement and operation and adaptability to varying local siding arrangements and power and water facilities were equally important to maintain its mobility.

These requirements applied particularly to the freezer unit, since the desired freezing capacity was large when compared to the space available. This unit was arranged essentially as a blast freezer. It consisted of conventional components of blower, evaporator or blast coil, and space for holding the product being frozen, all adapted to the space limitations of a railway



FREEZER developed by Transit Freezers Inc., is essentially a compact air blast unit. Mobility assures a long season of use.

With Short Operating Seasons

storage car. Machinery for refrigeration is mounted on a truck-trailer

refrigerator car. The car was additionally insulated, and door openings were relocated for more convenient handling of the product.

Freezing Unit

The blower and blast coil assembly are located in one end of the car, where they occupy less than half of the floor space. The remaining space is used for holding the product being frozen. The product is loaded on wire mesh-bottom trays which are placed on racks equipped with casters. These are loaded in the freezing space. Air is blown through coils and then through the product. It is returned through an overhead duct, separated from the rest of the car by a horizontal partition, to the blower for recirculation.

Space for product in the car was designed for 18 racks, although 21 may be crowded in. Each rack holds 15 trays, approximately 30 in. sq. The racks are placed three abreast to the air flow and as many deep, up to seven, as may be required. The quantity of product loaded on each tray will vary according to its nature and density, and to the shape and dimensions of the individual packages. For design purposes, 30 lb. was taken as the individual tray load. It was later found that some packages, particularly 1-lb. metal-end rectangular fiber containers, could be loaded at the rate of 35 per tray.

Filled racks are loaded into the car through a door in the end opposite the coils and blower. After the products are frozen, the racks are taken out of the car through a side door near the coils.

By entering the end of the car most remote from the coils and advancing progressively toward the coldest part of the freezing space, the product is exposed to the coldest blast when it is almost frozen. This counter-flow arrangement results in favorable temperature differentials, and protects the partially frozen material from the warming effect of the freshly loaded packages. Furthermore, since the warmest product is placed at the end of the air travel, an appreciable rise in air temperature is obtained just before the air is recirculated through the coils. This increases the working temperature differential between the air and coil surfaces, with a resultant gain in coil performance.

Calculations made on the first trial run showed that the usual procedure of selecting equipment on the basis of load and performance requirements and then providing housing and structure to conform could not be followed because of the space limitations in the car. Consequently, the equipment had to be selected on the basis of dimension, and each unit of apparatus balanced for capacity against the other parts of the assembly.

The blast coil was also designed to reduce interruptions during the freezing period. Defrosting was reduced to a minimum, avoiding at the same time the mess associated with defrosting and apparatus necessary for brine sprays or other means of continuous defrosting. This was accomplished by using a coil, made of bare pipe and designed for flooded operation to obtain maximum heat transfer rate. Ammonia was selected as the refrigerant.

Refrigerating Coils

About 7000 lineal feet of 1-in. pipe were used in fabricating the coil which, together with the exposed surfaces of headers and subheaders, has a little more than 2,500 sq. ft. of effective prime heat transfer surface. The coil is 44 rows deep and it was assembled with a face less than 6 x 8 ft.

The surge drum is mounted on top of the car. Liquid refrigerant expands into the surge drum, and the sub-cooled liquid is delivered through a liquid leg and longitudinal header from which each of the 44 rows of coil is separately fed. Individual rows of coil are divided into four circuits so that no branch of the coil exceeds 50 ft. between liquid feed and discharge to suction header. For convenience in construction, the suction ends of the individual circuits are received into four suction subheaders, 11 rows of coil to each, and the four headers

are tied into the surge drum above.

Temperature of the refrigerant in the coil was set at –20 deg. F. The quantity of air selected was 40,000 cfm, giving a velocity approaching 1000 fpm, as measured over the gross face area of the coil. The temperature of the air leaving the coil and available to the first row of racks was taken initially as –10 deg. F. Calculations indicated that after heat gains through construction and infiltration and allowances for fan energy were deducted, there would be available a net useful refrigerating capacity of approximately 275,000 Btu. per hr. This was sufficient to freeze 1500 to 2000 lb. of foodstuff per hr., depending on its nature and condition.

To balance the freezing operation and develop the coil capacity, it was necessary for the product to have sufficient surface for adequate refrigeration. Consequently, sufficient product must be loaded into the freezer to provide the necessary surface for maximum coil performance. The freezer was originally intended for freezing small consumer packages. It was obvious that space would not be available for rapidly freezing large containers, such as 30-lb. cans, because a production rate comparable to conventional freezers could not be maintained. Consequently, freezer space was checked only for the smaller packages.

Freezer space was available for 18 racks, each holding 450 1-lb. packages, making a total of 8100 lb. It was calculated, from computation of heat transfer from the packages and the estimated freezing time of the individual packages, that freezer space was adequate for a loading rate equal to the estimated 1500 to 2000 lb. per hr. freezing capacity of the coil. For loose products, there was ample space to permit loading at rates in excess of the coil capacity.

Storage Car

The storage car, intended to hold the frozen product at 0 deg. F. until enough for a shipment had been accumulated, is separately refrigerated. Direct-expansion bare-pipe coils were used, 1¼ inch steel pipe being disposed over the walls and ceiling on five-inch centers, making essentially a cold wall construction. The coil surface is more than that needed to offset heat gains through transmission and infiltration. The surplus pipe is available for freezing small quantities at the beginning or end of the processing season and for supplementing the primary freezer. The coils are constructed in five sections, each fed through a separate thermal expansion valve. All the coils enter a small suction accumulator drum on the roof of the car.

The refrigerating machinery, consisting of compressors, condensers, and receivers, together with the electric and auxiliary apparatus and control and indicating devices, is mounted on the truck-trailer. Two non-interconnected refrigerating systems are used.

The refrigerating system that serves the freezer car consists of two compressors, with one common evaporative condenser discharging the liquid refrigerant through a pilot-operated, high-side float to the surge drum of the main blast coil. This system is manually operated without automatic controls other than the conventional safety devices.

The design of the blast coils was based on heat transfer data published in standard reference books. Previously, however, published values were found conservative, and the probability was recognized that the coil performance might be better than computed. Accordingly, the highside equipment selected was of somewhat greater capacity than the computed requirements of the coil. Two 20-ton compressors were selected, each operating at 2½ psi suction.

Refrigerating the Storage Car

The refrigerating system that serves the storage car consists of a smaller compressor rated 4¼ tons refrigeration at 5 psi-suction, and a shell and tube combined condenser and receiver. For condensing water economy, the shell-and-tube condenser of the smaller unit is connected to the pan of the evaporative condenser serving the two main compressors. This also permits the main condenser to be used as a cooling tower for the smaller unit. A by-pass connection is provided so that the small condenser may be served with water from the city mains or other sources, when the freezer car and its machinery are not in operation. This system is provided with thermostatic control actuated by temperature in the storage car, and with a head pressure-actuated condenser water control valve, so that it can be operated either manually or automatically.

Motors and other electrical apparatuses were designed for 460 volts. This voltage was selected because of greater economy and smaller space requirements than would be needed for equipment of lower voltage. Higher voltages could not be used safely without special insulation and safety precautions. Since most localities do not distribute power at 460 volts, or lower, in the quantity required for this machinery, especially for starting the main compressor motors, 2300-460 volt transformers were mounted on the trailer. Consequently, 2300-volt power lines, customarily distribution in most localities, could be tapped directly. The main compressor motors are started on reduced voltage. Other motors are started across-the-line.

Operating Experience

The mobile plant was constructed during the spring and summer of 1946, when materials and equipment were scarce. In spite of the prevailing shortages, the assembly had been completed by the end of the summer, except for the main compressors. A large compressor was temporarily connected to the blast coil, and the freezer was successfully used in the western part of Tennessee for lima beans. About 250,000 lb. of lima beans were frozen successfully. While no detailed tests were made, observations indicated that freezer capacity was as great as had been expected.

The following winter, the machinery trailer was completed. The specified main compressors were still unavailable, and machines having approximately 80 percent of the specified capacity were substituted. The plant was put into operation on strawberries, first in Louisiana and later in Michigan. As noted during the previous autumn, the capacity of the freezer was not less than expected. Even at maximum loads and with considerable frost on the coils, temperature differences between the coil surface and air were slightly less than had been computed. During heavy loadings, however, the substitute compressors were unable to maintain suction pressures as low as had been expected.

Defrosting of the blast coil has not been a problem. Coils are defrosted about once a week, when freezing prepackaged strawberries. They are defrosted for about 2½ hr. by shutting off compressors and blowing warm air over them.

Condenser water consumption has been light, amounting to only the normal evaporative and entrainment losses in the condenser. The head pressures have been generally moderate, with the evaporative condenser carrying the two main compressors direct and carrying the smaller compressor through circulation of water from the pan.

Chief Editor Joins Packaging Institute

L. V. Burton relinquishes the editorial direction of FOOD INDUSTRIES after 20 years—Becomes executive director of the Packaging Institute, coordinating technical organization of the packaging field—Retains connection with the magazine as a consulting editor—Plans for 1948 editorial coverage of the industry announced by the publisher

WITH this issue of FOOD INDUSTRIES, Dr. L. V. ("Larry") Burton relinquishes the editorial direction of the magazine after nearly 20 years in the Chief Editor's chair. His resignation enables him to devote his attention to managing the affairs of the Packaging Institute, a cooperative organization of package users, package supply manufacturers, and machinery builders. Membership is by corporation. Formed in 1938, the Packaging Institute pools technological information in its special field. Its headquarters are in New York City, which will make it possible for Dr. Burton to continue with FOOD INDUSTRIES as consulting editor, sharing in the publication's 1948 expansion plans.

Industry Problems

Since approximately two-thirds of all packaging material is used for food products, the Institute's new director will necessarily devote much of his time to the problems and opportunities of the food processor packagingwise. It is expected that he will prepare progress reports from time to time for FOOD INDUSTRIES readers, acquainting food manufacturers with new developments in this special field.

While building the editorial stature and acceptance of FOOD INDUSTRIES among food technologists and manufacturers, "Larry" Burton was one of the founders of the Institute of Food Technologists in 1939. This organization now has a solid membership of around 3,000, with no limit at present in sight on its future growth. Past presidency of the IFT is at the top of the editor's list of society membership and honors. His other memberships have been constantly valuable in drawing material for the magazine, although some of them were primarily labor-of-love jobs. Among them are:

American Chemical Society

American Society of Refrigerating Engineers

Metropolitan Dairy Technology Society

Metropolitan Production Men's Club

American Association of Cereal Chemists

Society of American Bacteriologists

Member, Board of Governors, Refrigeration Research Foundation

Member, Industrial Advisory Committee, Nutrition Foundation

Member, Advisory Board, Military Planning Division, Subsistence and Packaging, Office of Quartermaster General

Dr. Burton carried out two missions during the war under Army auspices. In 1944 he served as a war correspondent in the Southwest Pacific, visiting Australia, New Zealand, New Caledonia and New Guinea. While covering the food front he was called on for visits and lectures by scientific and government groups. Some of his experiences were reported in FOOD INDUSTRIES. In 1945 he undertook a secret assignment in England. Although he was unable to write about these experiences directly, this activity gave him an opportunity to appraise wartime enemy developments in food processing.

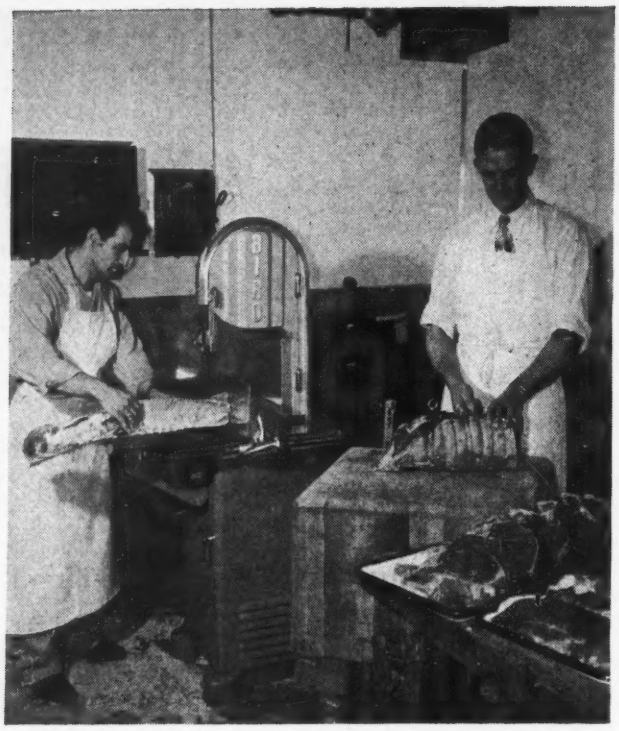
The Swedish government, through the Royal Academy of Engineering Sciences, has invited Dr. Burton to lecture on food preservation and food freezing in Sweden, Denmark and Norway in the spring of 1948. If he is able to accept this invitation, Dr. Burton will report sidelights on this trip.

Publisher's Plans

Plans for the magazine for 1948 as announced by M. A. Williamson, publisher of FOOD INDUSTRIES, include a substantial increase in the editorial content, greater picture coverage, additional attention to the specialized branches of the industry, and a number of special editorial projects which are not yet finally formulated.

Until a permanent editor is appointed, C. R. Havighorst, associate editor of FOOD INDUSTRIES in San

(*Continued on page* 212)



CUTTERS fabricate meats into retail cuts for the packaging department at Grand Union's Hempstead, Long Island, supermarket.

ELEVATOR delivers meat cuts prepared by the butchers to the wrapping department located behind the self-service cases.

Prepackaging Of Fresh Meats—

For success, the operation should be conducted near the point of sale. Meat

By JOHN V. ZIEMBA
Assistant Editor
"Food Industries"

WHATEVER changes take place in the present trend toward the prefabrication and prepackaging of identifiable fresh meats, they will be gradual ones, despite the increasing number of retail stores engaged in this operation. The changes will be influenced chiefly by consumer preference for prepackaged meats, pending the solution of many problems by meat packers, retail stores and meat cutters' and butchers' unions.

Possibility of meat packers prepackaging fresh meats is remote at the present time. Some packers, however, and most retailers feel that successful fresh meat prepackaging can be accomplished more satisfactorily by retailers behind the counter or in a chain store central warehouse than at the meat packers' plant. Quality control can be more easily assured and the operation is more likely to become successful the closer it is to the point of sale.

To prepackage fresh meats, meat packers must solve such problems as: (1) Proper selection of meats, (2) best and most practical methods of packaging by recommending types of wrapper, containers and liners offering the best protection, (3) proper equipment for initial packaging operations, and (4) proper temperatures and humidities to maintain top quality.

Chief problem confronting meat packers today is maintaining the quality of prepackaged fresh beef, pork, lamb and veal cuts after they leave the plants. Fresh meats, for example, tend to discolor when wrapped in transparent material and exposed to artificial light in a self-service case.

Why Packers Can't Prepackage

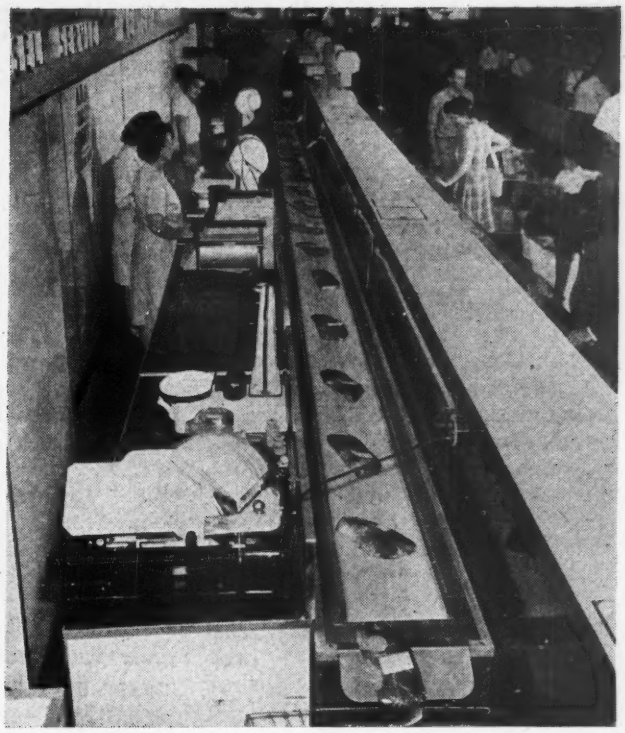
To be successful, the fresh meat prepackaging operation must be mechanized for mass production. At present, meat packers do not have the necessary facilities. Many do not have band saws, stew meat dicers, patty making machines, Bunn tying machines for roasts, wrapping machines and heat sealers. Refrigerated delivery trucks and equipment are also needed. Then, too, prepackaged fresh meats must also be packed in master containers. Private labels would be required as well as labeling machines.

Meat packers might run into difficulty in standardizing cuts and accepting orders from stores, which may require different meat cuts, depending upon the neighborhood. For example, one store may order prepackaged steaks, leaving the meat packer at a loss as to what to do with remaining cuts.

The interval between prepackaging and final delivery to stores by packers is greater than when retailers prepackage and service their cases. Consequently, product deterioration is greater the longer it takes to deliver the packaged fresh meats to the self-service cases.

A certain amount of repackaging would be required because of damaged packages and discolored meats. When sliced luncheon meat is wrapped in a transparent material, the top slice discolors perceptibly within two hours when exposed to artificial light in a self-service case. After about 12 hours discoloration is objectionable. It is then necessary to open the package, replace the discolored slice with a fresh one and repackage. The sur-

WEIGHING, labeling and wrapping meats are the next steps. Labels show weight, price per lb. and total cost of the meat.



ENDLESS BELT conveyor carries meat to wire baskets after they are packaged. Supervisor services cases with packaged meats.

By Retailer Or Meat Packer?

packers may assist retailers with their prepackaging and handling problems

face of roasts, steaks and chops, packaged in transparent material, also discolors, necessitating trimming and repackaging.

What Packers Can Do

In view of these problems, meat packers can serve retailers best in an advisory capacity at the present time. They can pass along information on meat cutting, packaging, merchandising methods, costs and yields from primal to retail cuts and how best to handle prepackaged meats to maintain product quality. They can advise retailers on the type of retail cuts to make from primal cuts. For example, stores not engaged in prepackaging frequently cure the brisket and plate to make corned beef. Better utilization, however, can be made of these cuts and also of the trimmings by using them for ground beef or beef stew and packaging them attractively.

By showing retailers percentage yields from certain primal cuts, retailers will know the amount of fat, bone, lean meat and trimmings they can expect. Consequently, for a given weight of primal cut, retailers will know their dollar return.

Retailers may find, for example, that customers prefer ¾ in. instead of 1 in. thick steaks. Losses will occur if six ¾ in. steaks and left-over meat are sliced from a cut from which five 1 in. steaks can be sliced. Packers can instruct retailers how best to cut the steaks and use left-over meats.

Meat packers have gained considerable experience in packaging research. They know packaging material requirements for various classes of meat products. They interchange packaging ideas and problems with suppliers of packaging material and equipment. Consequently, packers can also advise retailers on the use of proper materials and equipment for prepackaging fresh meats as well as refrigerating equipment and self-service cases.

Valuable tips can also be passed along to retailers on how best to package fresh meats. For example, there are tricks to packaging frankfurts. Instead of arranging them in a single row of seven or nine frankfurts on a cardboard backer and overwrapping with a transparent material, they can be pyramided in two rows of four and three or five and four frankfurts and overwrapped, without using a cardboard backer. Pyramiding provides the package with the necessary rigidity.

Meat packers can also advise retailers on best methods of handling prepacked fresh meats during merchandising to minimize product deterioration. Packers could provide retailers with a technical service. Their food technologists could visit some of the markets, study the retailers' problems and bring these problems back to the chemical research and development departments for solution.

How Packers Can Benefit

Fresh meat prepackaging will increase the packers' meat sales. It will also provide them with the opportunity of displaying their brands, if they furnish labels to retailers. If consumers accept prepackaged fresh meats, this method of self-servicing may serve as the foundation for the prefabrication and prepackaging of frozen meats by the packer.

An important factor in this development is the labor situation in some sections of the country. Labor

may be forced to realize that the prepackaging of fresh meats is economically sound. While labor cannot stop this development, it can slow it down considerably. Present trend indicates that the prepackaging of fresh meats for consumer self-service will increase the amount of meat sold. Consequently, more butchers will be employed, rather than fewer.

Labor may protest about men losing jobs, since prepackaging might reduce the number of butchers required in retail stores prepackaging fresh meats. But approximately two-thirds of a butcher's time in servicing customers behind a meat service counter is devoted to selecting, weighing, pricing and wrapping meats. Butchers make more efficient use of their time by cutting meats for self-service. One butcher, cutting continuously, can accomplish as much as three butchers working behind the service meat counter.

Advantages of Prepackaging

Outstanding advantage of self-servicing prepackaged meats is the time saved by customers and butchers in relieving congestion at the meat service counter—one of the three bottlenecks in supermarkets, interfering with store traffic. Labor costs have been also reduced by making more efficient use of skilled butcher help.

Floor space in a store is at a premium. Consequently, it is possible to reduce floor space requirements in the meat department by self-servicing prepackaged meats.

Merchandising studies have shown that housewives buy more of the cheaper meats when they are packaged. These include stew meats, ground beef, patties, kidneys, hearts and many others. There is additional revenue in prepackaging give-away items such as suet and soup bones. One chain store is now wrapping two lamb leg bones in a package and selling them for $0.14, instead of selling them back to the packer for a few cents. This store found that housewives prefer to purchase packaged bones.

It is not always necessary for markets to go 100 percent for prepackaging. A combination service and self-service method of merchandising will relieve some of the congestion at meat service counters. At the same time it will offer customers the choice of either being served or servicing themselves.

Some retail stores have increased their sales volume with a lower overhead as a result of a greater turn-over of less popular, slow-moving items, such as stew meats, soup meat and variety meats like sweetbreads, kidneys, livers and hearts. Spoilage losses have been reduced by increasing their turnover through close supervision of self-service display cases. Prepackaging makes it possible to move meat cuts in better balance by selling them as they are or as customers prefer them.

Most stores have increased their profits by selling stew meats, ground beef and patties made from trimmings. Some markets, however, have found that their profit margin is lower with the self-service method of merchandising, despite increased volume sales.

What Retailers Must Know

Retailers must know how to adequately prepackage fresh meats in transparent materials to provide product visibility, to resist tearing due to rough handling and puncturing by sharp bones, and to permit "breathing" so as to prevent moisture condensation, surface slime formation, mold growth and meat souring.

Labels are neither greaseproof nor bloodproof. A protective system must be devised by retailers for the labels. At present, a thermoplastic label is being effectively used to supplement conventional style labels. It can be heat sealed on the outside of the package.

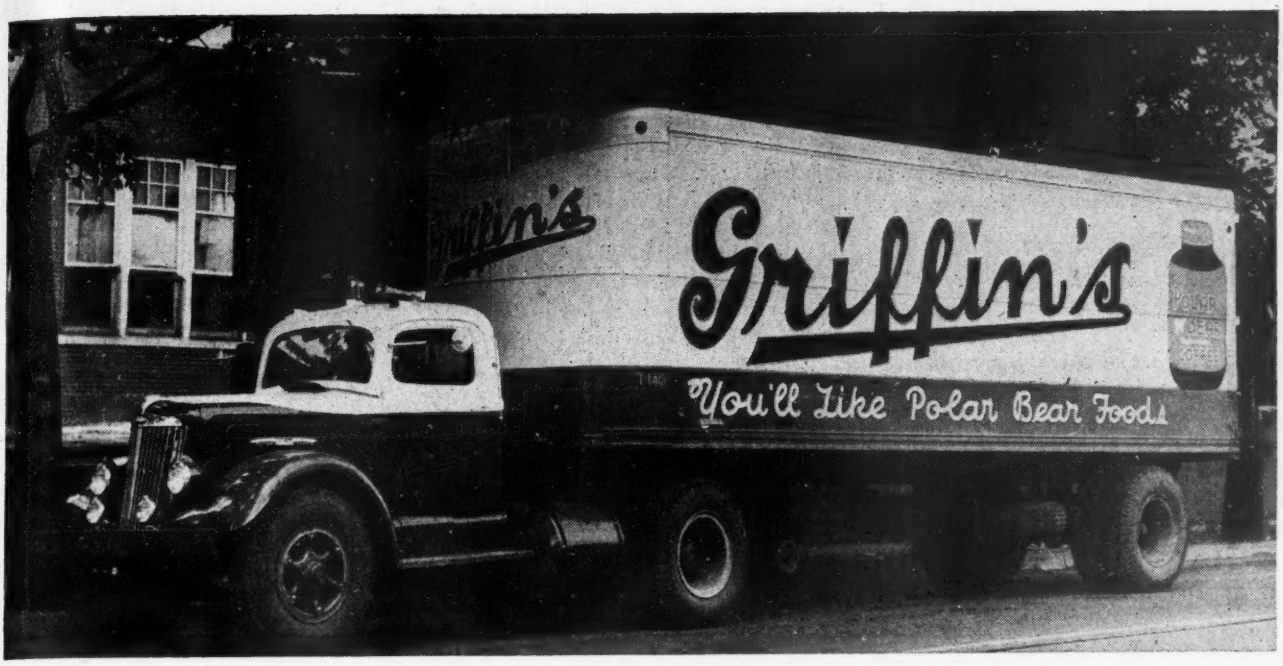
Labels should not be so large as to obscure most of the product. Labels must identify meat cuts and show grade, total weight, price per pound, and total price. Code letters or symbols should be stamped or perforated on labels to identify cutting and packaging date. Codes enable retailers to move older packages first by keeping them in the front section of the self-service case. Meats about to discolor must be rotated to the front of the case.

Properly designed and operating refrigerated, self-service cases must be installed in stores, with temperatures maintained at 34 deg. F. to 36 deg. F. These cases must be serviced constantly and packages with torn wrappers and broken seals must be removed and repackaged. Badly discolored meats must also be trimmed and repackaged.

(*Continued on page* 217)

MEAT CASE for self-servicing meats at Grand Union store is divided into sections for pork, beef, veal, lamb, poultry, luncheon meats, variety meats and smoked and cured meats.

ADVANTAGE of prepackaging operation is time saved by customers and butchers.



THE FLEET is made up of 40 of these trailer-tractor units and 110 straight trucks, which carry 70 percent of the company's haulage.

Trucks Win Southwest

With help of its fleet, this former produce house grows into an area-wide grocery distributor, operating its own canning and coffee roasting plants

AUTOMOTIVE equipment, trucks and tractor-trailers, have played a major role in the growth of the Griffin Grocery Co. A modest produce business in 1908, the company has developed until today it is one of the largest manufacturing and wholesale grocery distributors in the entire southwest.

The Griffin company, whose general offices are now located in Muskogee, Okla., operates 15 wholesale branches in the States of Oklahoma, Texas, Arkansas and Missouri. From these branches the company serves a territory extending from Fort Scott, Kan., on the north to Waco, Tex., on the south, and from Russellville, Ark., on the east to the Oklahoma-Texas border on the west. (See map on next page.)

Distribution Area

The relative location of the principal cities in the above distribution area and the cities in which the Griffin wholesale branches are maintained are shown in the accompanying map. The branch houses are located in Oklahoma at Muskogee, Oklahoma City, Seminole, Okmulgee, McAlester, Pryor, Tulsa, Antlers and Lawton; in Texas at Dallas and Denison; in Arkansas at Fort Smith and Rogers, and in Missouri at Joplin.

In addition to the grocery warehouses and offices maintained in these different cities, the Griffin company operates a large canning factory in Muskogee as well as one of the largest and most modern coffee roasting plants in the Southwest.

Traffic Problems

The Griffin company distributes green produce as well as dry groceries. Produce houses are maintained at McAlester, Okla.; Fort Smith, Ark., and Denison, Tex. However, these produce houses serve their own delivery areas only and produce is not distributed between all branches.

The Griffin traffic problem consists of the procurement of the green goods and dry groceries from the various sources of supply, the processing of some items, the transfer of goods between the various branches and the final delivery from the branches to retail stores in the distribution area of the individual branch. Various units of the Griffin 190-truck fleet are used in each of these phases of distribution.

Roughly, 30 percent of the company's distribution is by railroad and 70 percent by their own automotive equipment.

The 30 percent rail and 70 percent automotive ratio indicates the company's dependence upon its own truck equipment and explains in part how this equipment has enabled the company to expand and serve areas without rail facilities and which could be covered in no other manner.

The Griffin 190 vehicle fleet is made up of 110 straight trucks and 40 tractor-trailer combinations. The straight trucks carry average payloads of 10,000 lb. each. The tractor-trailer payloads average 22,000 lb.

Standard Trucks

By makes, the trucks and tractors include Fords, Chevrolets, Dodges, Internationals, General Motors trucks, Macks and Whites. In the semi-trailers are included two sizes of Trailmobiles, a tandem-axle model with a 32 ft. 6 in. body and a single-axle model with a 26 ft. 6 in. body.

The trucks are used for the final deliveries from the branches to the retail store customers. The tractor-trailers are employed to pick up goods from sources of supply and to haul merchandise from the main Muskogee plant to the various branch warehouses.

Use Refrigeration

Some of the trailers are protected by 5 in. insulation and equipped with a water ice refrigerating system and air circulating fan to maintain an inside body temperature of from 32 to 40 deg. F. These insulated trailers are used to pick up the company's incoming green produce and sometimes to make final deliveries in large quantities.

The refrigerated tractor-trailer units are used to make produce pickups from Louisiana, south Texas, Colorado, the Rio Grande Valley and California. The longest haul is from Los Angeles to the produce branch in McAlester, Okla.

The company's green coffee imported through New Orleans and other Gulf ports is all shipped by rail to the Muskogee roasting plant. After processing, it is distributed by the tractor-trailer combinations to all of the company branches.

Usually the back hauls between the home plant and the branch houses of a wholesale grocery distributor are made empty unless there are sources of supply along the route. There are no such sources along the Griffin inter-branch routes.

However, the Griffin company has been able to reduce the unit cost on its inter-branch haulage by carrying back loads through the medium of shipping carloads of merchandise by rail to the farthest outlying points and back loading such goods in smaller amounts to intermediate branches on the return trip to the main warehouse in Muskogee. The carload rate is so much lower than the less-carload rate that the combined outbound carload cost and the back load cost on the company's own tractor-trailers is less than the outbound cost on the company's trucks.

Vehicle Maintenance

The majority of the company's tractor-trailer combinations are garaged at the main warehouse in Muskogee together with the straight trucks required for the Muskogee branch final retail store deliveries. Straight trucks required for the individual branch final deliveries are garaged at those branches. The insulated tractor-trailer units engaged in the produce hauls are maintained at the three produce warehouses in McAlester, Okla.; Fort Smith, Ark., and Denison, Tex.

However, only running maintenance is provided for the vehicles at the individual branches. The company has a large central repair shop at the Muskogee plant. The branch trucks stored at the other 14 outlying warehouses are returned periodically to the Muskogee central repair shop, where all major repairs are made.

Cuts Repair Costs

This decentralized running maintenance at the individual branch warehouses and the centralized major repair work at Muskogee result in a lower cost per mile for repairs than if major repairs were attempted at each branch.

Such a plan would require a shop at each branch or utilization of the services of outside local dealer service stations. Both of these are costly. In the first case a high capital investment is required. In the second, the lack of adequate repair facilities for all makes of trucks in most of the outlying branches in the smaller cities and towns would necessitate delays and often result in inadequate repair jobs.

One of the company's typical tractor-trailer combinations is shown in an accompanying illustration. The unit pictured consists of a White tractor and a single-axle Trailmobile semi-trailer with a 26 ft. 6 in. body.

The tractor is fitted with a 40 gal. bolster safety gasoline tank. This, with the 30 gal. tank located on the tractor running-board, gives a total fuel capacity of 70 gal. At an average gasoline consumption of 4 miles to the gallon, this gives a running radius of 280 miles before requiring a replenishment of fuel.

The same size tires are used all around on the tractor and the semi-trailer so that only one size of spare is required. However, two spares are carried on let-down racks beneath the trailer floor just ahead of the axle.

Clean Appearance

Because the growth of the Griffin company has been made possible by its trucks, the company is very proud of its automotive equipment and has attempted to get the greatest possible advertising value out of it. They have adapted an unusual painting and lettering layout. In keeping with the trend to employ some light color paint as a suggestion of cleanliness in handling food products, one of the basic colors chosen was white. The other was red.

GRIFFIN operates from Fort Scott, Kan., on the north, to Waco, Tex., on the south and from Russellville, Ark., on the east, to the Texas-Oklahoma border on the west.

FOOD PLANT EQUIPMENT

Displays developed for the food industry will form a part of nearly every exhibit at the 21st Exposition of Chemical Industries in Grand Central Palace, New York, December 1 to 6, if advance notices are any criterion.

The list embraces every phase of food plant operation, and includes processing equipment, production machinery, structural materials, materials handling equipment, equipment for laboratories serving the respective purposes of research and production control and instruments of every description.

Looking Over the Chem Show

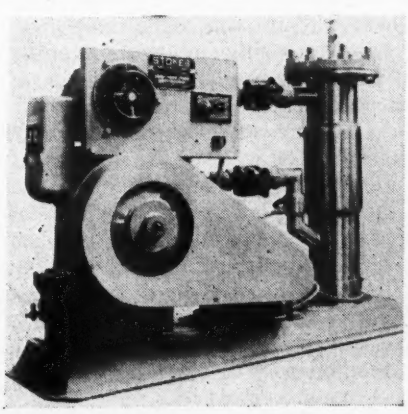
New equipment of interest to food plant operators on view at Grand Central Palace—For filtering, drying, filling, materials handling

By ARTHUR V. GEMMILL, Assistant Editor, "Food Industries"

CONSIDERABLE equipment has been developed in consonance with the important part that vacuum now plays in various drying and distillation processes. One of these is a laboratory or pilot production model of a rotary high vacuum fractionating still which is to be exhibited at the booth of National Research Corp., Cambridge, Mass. This still operates on a new principle that permits close separation of high molecular weight materials under high vacuum.

A new high vacuum "packaged" pump unit for the rapid removal of large volumes of air in high vacuum practice will be exhibited by F. J. Stokes Machine Co., Philadelphia, Pa. The unit combines a standard Stokes Microvac high vacuum rotary mechanical fore pump with a diffusion pump. It comes complete with control panel and switches, oil clarifier and gages. The diffusion pump is of stainless steel construction. Electrical heating elements are not submerged in the pump oil, which avoids overheating and undue deterioration of the oil. Capacity of the unit to be exhibited—400 cu. ft. per min. at 100 microns.

Dry vacuum pumps in operation at pressures in the low micron range, vacuum tight valves, special heated separator tanks and a line of liquid pumps will be exhibited by Kinney Mfg. Co., Boston, Mass. This exhibit is pointed at the high vacuum market.



Drying Equipment

In the field of drying there are to be a number of exhibits of interest to the food processors.

The new Buflovak filter drier, which combines a number of successive operations such as heating, cooling, distilling under reflux, evaporating, extracting, filtering, removal and recovery of solvents and final drying of the material under vacuum, will also be exhibited. New construction features permit sterilization of the internal parts.

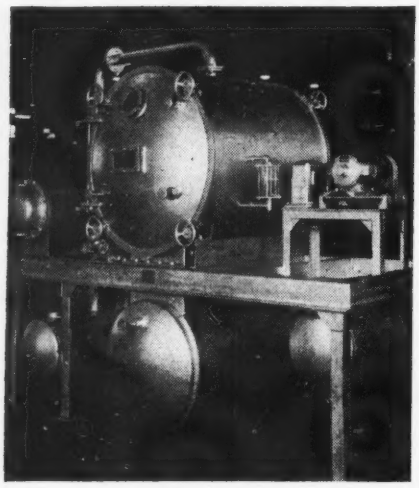
Swenson Evaporator Co., Harvey, Ill., will exhibit a model of their spray drier and evaporator. The booth will also contain large photographs of evaporators, filters and crystallizers.

Glass models of a Ruggles-Coles rotary drier and a 12-in. dia. conical ball mill will be in operation in the booth of The Hardinge Co., Inc., York, Pa. Other exhibits will include a large animated transparency showing the Thermomill (com-

Chem Show (Cont.)

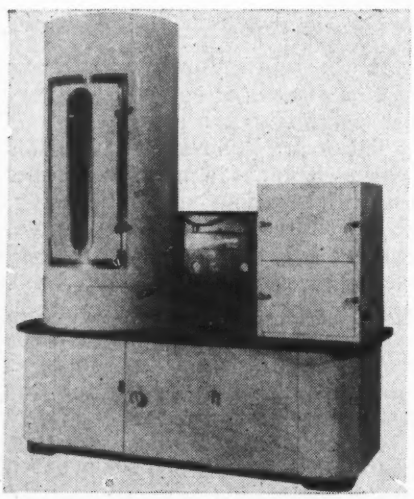
bination of heater, mill and air classifier) in operation, and a size B constant-weight feeder.

A pilot plant vacuum twin and double drum drier for research, product development, or small scale plant operations will be exhibited by Buflovak Equipment Div., Blaw-



Knox Co., Buffalo, N. Y. It can be operated as a vacuum, atmospheric, standard double drum or twin-drum drier for experimental pilot plant work on a variety of food, chemical and pharmaceutical products.

A research spray drier for experimental and pilot plant use, which is well adapted for spray drying in the lower temperature range, will be displayed by Glen-

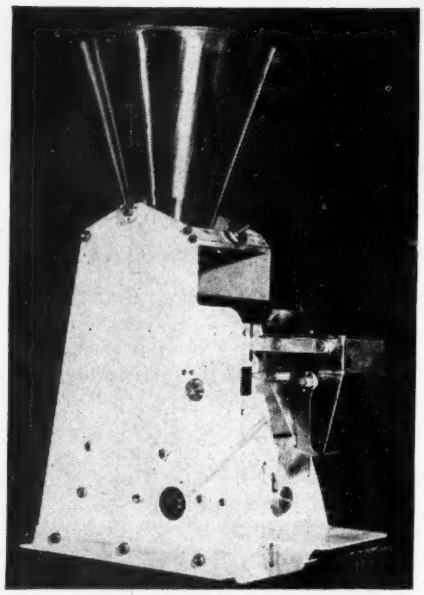


garry Machine Works, Inc., Bay Shore, N. Y. This unit, which is capable of evaporating from 8-15 lb. of water per hr., comes completely packaged and ready for operation. Controls are mounted on a panel in close proximity to a large sight glass.

Set against a graphic background showing the application of Proctor equipment to the chemical process industries, several machines of interest to food processors will be in the Proctor & Schwartz, Inc., Philadelphia, Pa., booth. There will be a Proctor 20 tray drier with an automatic door opening device. This relatively inexpensive machine is applicable to drying moderate quantities of powdered materials. The Proctor electrically heated laboratory drier—the baby of the line—will also be shown. This is a versatile, small laboratory drier that is widely used for experimental drying. It makes possible close control and low cost in drying a wide variety of samples.

Filling and Labeling

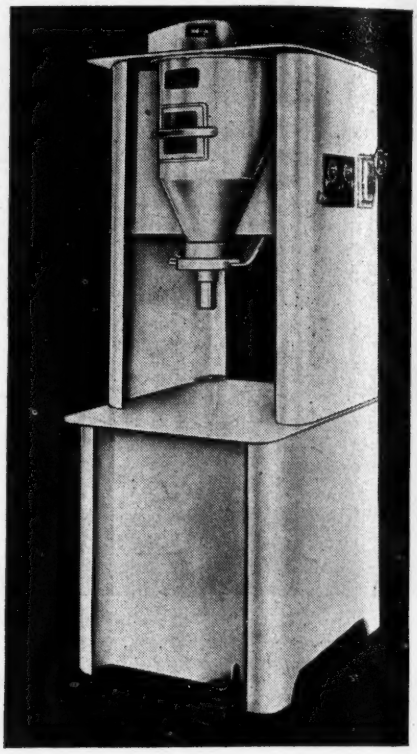
Another phase getting wide attention is that of filling and labeling. Glengarry Machine Works, Inc., Bay Shore, N. Y., will exhibit an inexpensive net weight semi-



automatic filling machine called Thrifty Weigh. It handles any type of container from 1 to 10 in. in height and accurately weighs quantities from 1 oz. to 2½ lb. Capacity, 10 to 20 discharges per min. An interesting application that will be demonstrated is the use of two Thrifty Weigh machines for the accurate metering or proportioning of dry materials. By use of a synchronous timer, it is possible to obtain a very accurate discharge of material for a given time interval.

The Karl Kiefer Machine Co., Cincinnati, Ohio, will exhibit a Vari Visco filler for filling liquids or semi-liquids in jars or cans. The filler will handle containers from ½ oz. to 1 qt. at speeds from 12 to 250 per min. Especial emphasis is placed on ease of cleaning.

A new auger-type filler, which will handle pulverized, granular, crystalline or paste materials in a range from ⅓ oz. to 10 lb., at speeds up to 10 per min., is to be



exhibited by the George R. Rodgers Co., Inc., New York. It will fill all types of rigid or flexible containers. A simple dial adjustment controls package fill time and permits accurate changes for any type of material.

A 12-spout fully automatic rotary vacuum filler for filling all types of liquids and semi-liquids in amounts from 1 oz. to 1 qt., at a speed up to 60 qts. or 80 pts. per min., will be displayed by MRM Co., Inc., Brooklyn, N. Y. The filler is equipped with automatic intake and discharge conveyor and variable speed drive. It will fill any shape container including sprinkler-top bottles and open top cans. A portable semi-automatic filler for 1 oz. to 1 qt. glass and metal containers and a semi-automatic gravity filler, designed to handle gallon metal containers, with a capacity of 10 gal. per min., will also be on display.

New Jersey Machine Corp., Hoboken, N. J., will exhibit a fully automatic standup Pony Labelrite machine capable of applying labels to bottles at speeds up to 60 per min. It picks up the label by vacuum and applies an over-all coverage of glue before placing it upon the bottle. Maximum label size handled by this machine is 6 in. wide by 3½ in. high. A semi-automatic machine which applies thermoplas-

tic labels without glue will also be exhibited. In this machine the unit that heats the labels is in the vacuum pick-up plate. This company will also exhibit a coding machine which applies a code number to the label at the rate of 250 per min.

In operation at the booth of Pneumatic Scale Corp., Ltd., North Quincy, Mass., will be a Rota air cleaning machine which air cleans almost any size bottle up to and including the 1 qt. size, at the rate of 120 per min. Containers are fed into the machine by means of a dial spider, which permits connection into a synchronized line for continuous operation. This machine was illustrated and completely described on p. 158 of the October, 1947, issue of FOOD INDUSTRIES.

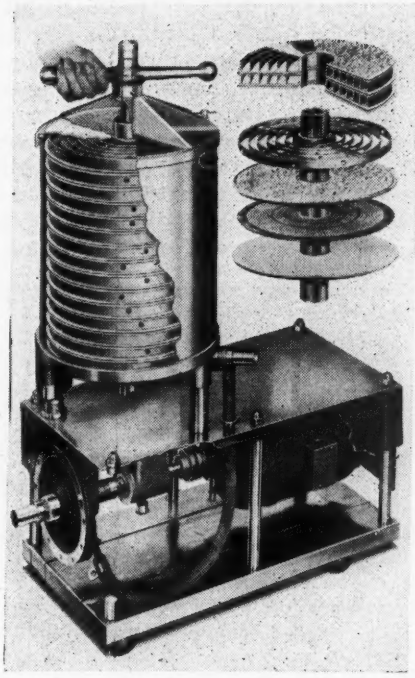
Economic Machinery Co., Worcester, Mass., will exhibit a Uni-turret World labeler that can be installed in either a single or twin unit giving labeling speeds of 65 or 120 bottles per min., respectively.

An improved Model U-1 Auger Packer is to be exhibited by Triangle Package Machinery Co., Chicago, Ill. This semi-automatic machine requires but one unskilled

operator. It will fill difficult-to-handle materials into cans, cartons, bags, jars or bottles, in sizes from 1 oz. to 5 lb., at speeds up to 30 per min. A volumetric filler and a high speed Elec-Tri-Pak weigher will also be displayed.

Filters and Centrifuges

Exhibiting its improved Sealed-Disc filter, Alsop Engineering Corp., Milldale, Conn., indicated that the unit will be available in stainless steel, monel metal, nickel, brass and bronze or iron and steel. Filters are of the horizontal disc pressure type and are designed for all general batch filtration work.



They are completely enclosed, leakproof, vaporproof, compact and portable. Splashproof stand protects motor and pumps from spilled liquids.

A new large capacity pressure-leaf filter with 21 filter leaves and a filtering area of more than 500 sq. ft., adaptable to large-scale food plant operations, will be on display at the booth of Niagara Filter Corp., Buffalo, N. Y. This unit is fabricated entirely of 18-8 stainless steel, including the fine-mesh wire surfaced leaves. An automatic leaf washing mechanism, which permits cleaning in less than 15 min. without opening the filter, is built into the cover.

Fletcher Works, Inc., Philadelphia, Pa., will exhibit a 26-in. under-driven centrifugal in which the basket combines easy removability for discharging the cake with secure fastening while in operation. Features are: Absolute cleanliness due to the open top construction; and rapid production, obtained through the removable basket.

In the exhibit of T. Shriver & Co., Inc., Harrison, N. J., a new plastic filter press for corrosive or delicate materials will be displayed. It is light in weight, translucent, smooth and easily cleaned and is said to be resistant to high temperatures and to cost less than most corrosive resistant alloys. Other exhibits by this company include a new enclosed, portable pressure filter in which the tank is never under pressure, and a hydraulic closing device for any type of filter press.

The Bird-Young continuous rotary vacuum filter, to be exhibited at the booth of Bird Machine Co., South Walpole, Mass., is designed for high capacity, high efficiency separation of slow or free filtering solids from liquids. It permits thorough counter current washing and separation of wash liquors in as many stages as desired.

Grinding and Pulverizing

Raymond Pulverizer Div., Combustion Eng. Co., Inc., Chicago, Ill., will exhibit an 18-in. vertical mill for fine grinding, in the range from all passing a 325-mesh screen to 5-10 microns. Built-in classifier insures close sizing of product.

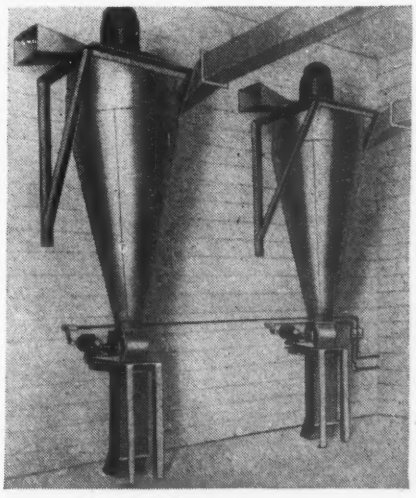
Key machines from their line of Mikro-Pulverizers and Mikro-Atomizers, capable of producing grinds from coarse disintegration down to micron sizes, and with capacities ranging from 10 lb. to 24,000 lb. per hr., will be exhibited at the booth of Pulverizer Machine Co., Summit, N. J.

Colloid mills, in 3-in. belt driven, and 6 and 8 in. direct coupled models, are to be exhibited by Premier Mill Corp., Geneva, N. Y.

Materials Handling

A laboratory working model of a new type pneumatic materials handling system for dry materials is to be shown by Sprout, Waldron & Co., Muncy, Pa. It is designed for handling product from grinders, bulk materials from box car to storage and from one processing stage to another.

Special design features are said to reduce product loss through col-



lector exhaust by as much as 10 percent, eliminating the need for a second filter collector. The entire system is under reduced pressure that is said to increase grinding capacity by as much as 30 percent per input hp.

A new tilting fork type of Work-

Chem Show (Cont.)

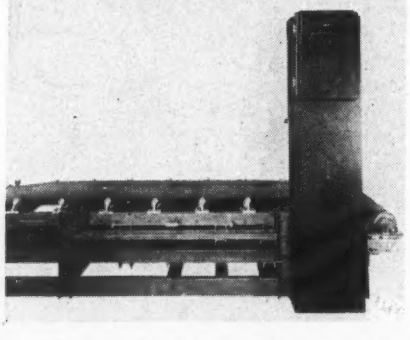
saver, for jobs too small for full-size fork trucks and too big for manual labor, will be exhibited by Yale & Towne Mfg. Co., Philadel-

phia, Pa. Batching dial scales, electric hoists, hand trucks and full-size electric lift trucks will also be demonstrated.

The Omega Machine Co., Providence, R. I., will display a full-size belt type gravimetric feeder, complete with bucket elevator in operation. The unit will be operated from a remote control station demonstrating many remote control features, including recording instruments with pilot lights and automatic batching control equipment.

The Streamliner Jr., a 10-ft. portable belt booster which uses a hydraulic jack to raise and lower the booster bed to the desired working level, is to be exhibited by the Harry J. Ferguson Co., Jenkintown, Pa.

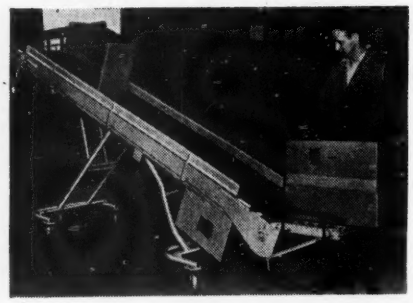
A full-scale working model of the Conveyoflo meter, weighing dry materials passing over a belt conveyor, will be the feature of an exhibit by Builders-Providence, Inc.,



Providence, R. I. It will control the rate of flow to a manually adjusted, pre-set rate and proportion secondary dry materials as well as liquids.

The Conveyoflo will be set up to proportionally control the output of the belt type gravimetric feeder which will be in operation in Omega Machine Co.'s booth as well as the Adjust-O-Feeder and Treet-O-Unit in Proportioneers' exhibit.

The Rapids-Standard Co., Inc., will exhibit a new light-weight aluminum Rapid-Wheel gravity conveyor for versatile duty in many types of plants; a new power belt conveyor with many unusual features which allow its use as a pusher in a gravity conveyor line,



as a stacker, or as a horizontal conveyor; and a new powered solid-roller belt conveyor.

Process Equipment

Photos and a diagram of the world's first plant for solvent extraction of cottonseed oil at Wilson, Ark., will be exhibited by Allis-Chalmers Mfg. Co., Milwaukee, Wis. A diagram of water conditioning equipment designed to classify and/or soften water for industrial processes and municipal purposes will also be displayed.

By the use of animated and illuminated transparencies along the walls of the booth, and of small-scale working models, The Dorr Co., New York, will feature new processes and products. Of especial interest to the food processor will be the Dorrco de-ionization system for producing pure water, juices and sirups by removing mineral impurities, and the Duo-classifier and Duo-filter for contact biological treatment of industrial wastes.

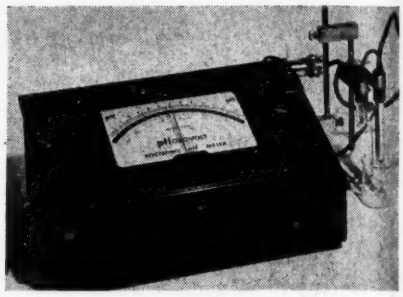
Progressive Equipment Corp., Chicago, Ill., will exhibit a stainless steel Selectro vibrating screen. This unit is recommended for many uses in the food processing industry, such as producing catsup and tomato juice without squeezing, sizing of diced vegetables, and removing excess water and liquors from vegetables.

Control Equipment

Mine Safety Appliances Co., Pittsburgh, Pa., will exhibit a combustion gas indicator for continuous testing and recording of gaseous or inert atmospheres. A supersensitive, light weight, hand operated instrument for the detection of CO will also be displayed.

A new viscosimeter, which permits instantaneous observation of viscosity values existing in a moving fluid stream under full line pressure, will be exhibited by Fischer & Porter Co., Hatboro, Pa. Other new products to be on display: An automatic ratio-controller, including a new F & P chemical service diaphragm motor valve, and a capacitance type flow alarm for use with Flowrator variable area flow meters.

Photovolt Corp., New York, will exhibit photoelectric and electronic measuring instruments for laboratories and process control; photoelectric colorimeters and fluorescence meters for general chemical

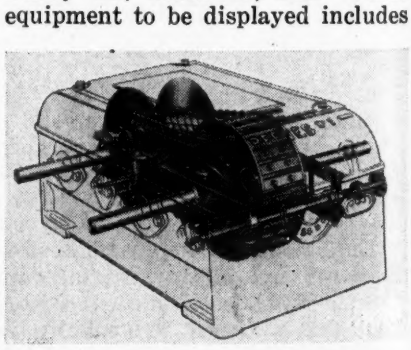


analysis and vitamin determinations; and reflection meters for color control and standardization. A new line-operated electronic pH meter, which operates from the power line instead of dry-cell batteries, will also be displayed.

Bailey Meter Co., Cleveland, Ohio, will display a potentiometer pyrometer, a resistance thermometer, an oxygen analyzer and recorder, an indicating telemeter and a recording area meter. The Bailey electronically-operated area meter, described on p. 159 of FOOD INDUSTRIES, Sept., 1947, will also be exhibited.

Power Transmission

A variable speed transmission built in sizes up to 87 hp. with adjustable speed ranges from 2:1 to 16:1 is to be exhibited by Reeves Pulley Co., Columbus, Ind. Other equipment to be displayed includes

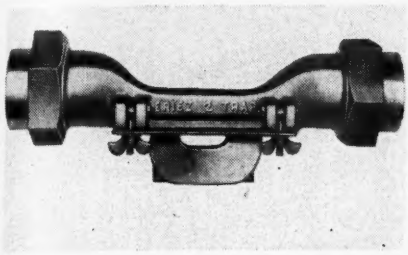


a Vari-speed motor pulley built in sizes up to 15 hp. with variable speed drive within 4:1, and a Vari-speed motor drive built in sizes to

15 hp. with speed variations from 2:1 to 6:1.

Solids Separation

Two new applications for Alnico permanent magnets are to be featured by Eriez Mfg. Co., Erie, Pa.: A permanently magnetized pulley that provides an efficient, simple means of automatically separating



magnetic material from non-magnetic material conveyed on a belt; and magnetic pipeline traps. Eriez permanently magnetized plate separators for removal of tramp iron and fine ferrous particles from gravity flow chutes and hoppers will also be exhibited.

Compressors

At the booth of Ingersoll-Rand Co., New York, there will be in operation a sectionalized reciprocating compressor for compressing oil-free air. This will be the company's ES-NL type which is used extensively in chemical and food processing. An additional feature will be the unusual photographic display of a number of large high-pressure compressors and blowers used in various processes. There will also be a working model of the new electric Impactool and a new air-operated light-weight Jackhamer drill.

Mixing and Agitating

Indicative of the growing importance of special mixing in the food and chemical industries is the working model of a 10 cu. ft. vertical mixing unit of stainless steel and Plexiglas construction to be exhibited by Sprout, Waldron & Co., Muncy, Pa.

Stainless steel mixing tanks will be displayed by Metal-Glass Products Co., Belding, Mich. A new 150-gal. unit with a high pressure jacket adapted to high temperature steam heating, lower temperature water heating and cooling, and extreme cooking operations under refrigeration, will be featured. A heavy duty, slow speed, horizontal agitator is used for thorough mixing.

Stainless steel tanks, both vertical and horizontal, and steam jacketed kettles, with and without gear driven agitators, will be shown by Geo. G. Rodgers Co., Inc., New York, N. Y.

An educational exhibit, with motion pictures depicting the technology of mixing as an engineering subject, will be featured by Mixing Equipment Co., Inc., Rochester, N. Y. Portable and laboratory mixers and accessories and a 36-in. dia. dispenser turbine and gear reducer will be displayed.

At the booth of Read Machinery Div. of The Standard Stoker Co., Inc., a vertical mixer for all kinds of batter will be exhibited. Also on display will be blenders for flour blending and shortening mixing and a double arm laboratory mixer designed for any and all types of heavy duty mixing.

A new continuous mixer designed to eliminate batch mixing in the process industries will be exhibited by Marco, Inc., Wilmington, Del. Known as the Roto-Feed Continuous Mixer, the equipment will handle products ranging from the viscosity and density of bread dough to liquids as fluid as water. When the product has undergone the mixing cycle, it may be directed to any subsequent processing equipment.

The Roto-Feed mixer is stainless, sanitary, easy to clean, and although not designed to handle dry materials alone, it will handle most types of products in the food, chemical, pharmaceutical and allied process industries.

Fluid Handling

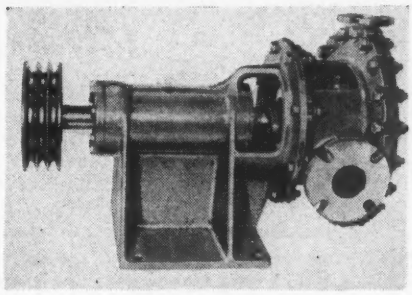
Premier Mill Corp., Geneva, N. Y., will exhibit the Esty variable volume positive displacement pump made of Hastelloy. It provides a simple means of varying volume for metering of fluids.

Tube fittings, flared and flareless, will be exhibited by The Parker Appliance Co., Cleveland, Ohio. Also to be exhibited by this company are tube fabricating tools and valves of all types.

New flanged conical end stainless steel fittings and Zephyrweld stainless steel welding fittings for use with light gage tubing are to be exhibited by Tri-Clover Machine Co., Kenosha, Wis. A complete line of sanitary fittings in both stainless steel and Trialloy and tools for erection and maintenance of industrial and sanitary types of transfer lines will also be displayed. Translites and photographs will show these fittings as used in a number of installations.

A new line of corrosion resistant plug gate valves, which can be used for throttling and for full-flow operation, will be exhibited by Crane Co., Chicago, Ill. Also on display will be all types of gate, globe, check and relief valves, flanged and screwed fittings, and fabricated piping.

A visual demonstration of the operating principle of an Allis-Chalmers automatic self-priming pump will be exhibited by Allis-Chalmers Mfg. Co., Milwaukee, Wis. A Plexiglas tank with Lucite tubing is used. Water is colored to distinguish it from the air pockets developed when the pump is starved. A 2x1½-in. model of the



company's PD process pump for handling corrosive liquors will also be on display.

Light walled stainless steel and Inconel tubing ⅛ to 22 in. O.D. is to be exhibited by Trent Tube Mfg. Co., East Troy, Wis.

A new line of hard rubber pipe and fittings from ¼ to 4 in. dia.—also tanks, buckets, funnels and vinegar sparge parts—will be shown by Luzerne Rubber Co., Trenton, N. J.

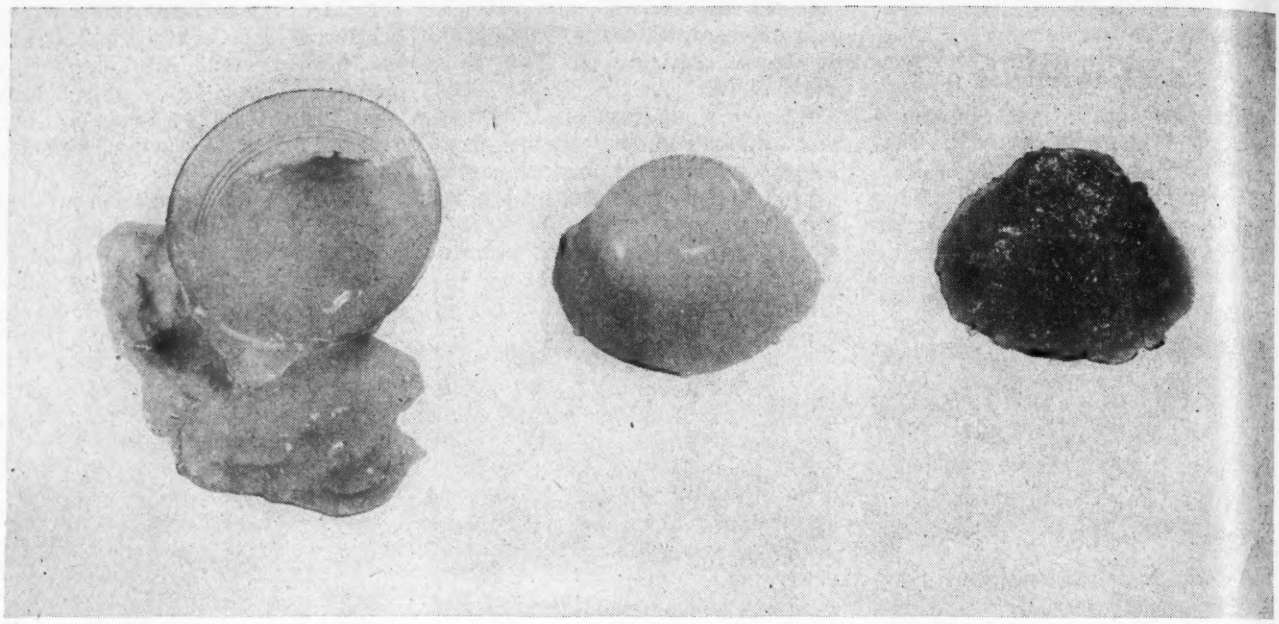
Corrosion resisting pipe and fittings, centrifugal pumps, heat exchangers and valves, both diaphragm and plug, are to be on display at The Duriron Co., Inc., Dayton, O., booth.

Centrifugal pumps made of corrosion resistant aluminum bronze, and fabricated assemblies of the same metal, are to be exhibited by Ampco Metal, Inc., Milwaukee, Wis.

Proportioneers, Inc., Providence, R. I., will exhibit a Treet-O-Control filling and loading pump with the no-drip, no-splash feature. An Adjust-O-Feeder in a special test stand equipped with pressure and vacuum gages to show actual performance under vacuums up to 30-in. and pressures up to 1,000-lb.; and a master control system which combines both volumetric and gravimetric control methods, will also be shown.

Sectional, full size models of Cameron chemical pumps with the patented Leakollector gland and Cameron shaft-seal will be exhibit-

(*Continued on page* 215)



STARCH PASTES prepared with Amioca, cornstarch and Clearjel (left to right) show differences in consistency and clarity.

Many Uses For New Stabilizer

Clearjel starch produces clear, fine-textured fruit pie filling with soft gelling properties. It may be used for caramels, marshmallows, fudges, chop suey bases for chow mein, cream sauces and clear gravies

By PRISCILLA A. DEUTSCH, Staff Editor, "Food Industries"

A NEW non-cohesive stabilizer, Clearjel, refined from a domestic waxy maize, has been introduced to the food field by National Starch Products, Inc., New York City, for use in fruit pie fillings, caramels, fudges, nougats and marshmallow, chop suey bases for chow mein, cream sauces and clear gravies.

The frozen food industry will find particularly useful the ability of Clearjel pastes to recover original body and fine texture after freezing. This makes it valuable for use in unbaked frozen fruit pie fillings, as well as in frozen chop suey bases and cream sauces and gravies used for precooked frozen foods.

Uses in Foods

Described as a superior starch of outstanding quality, it comes in white powder form, resembling ordinary cornstarch. For fruit pie fillings, both frozen and unfrozen, it produces a filling of fine texture with soft gelling tendency that maintains excellent clarity. The brilliance, depth and sparkle imparted to fillings give a tempting appearance to fruit pies and tarts. Because of its clarity, the new starch permits fruit colors to retain their original brilliance. Fruit properties remain undiminished because the stabilizer is free of cereal taste and gumminess.

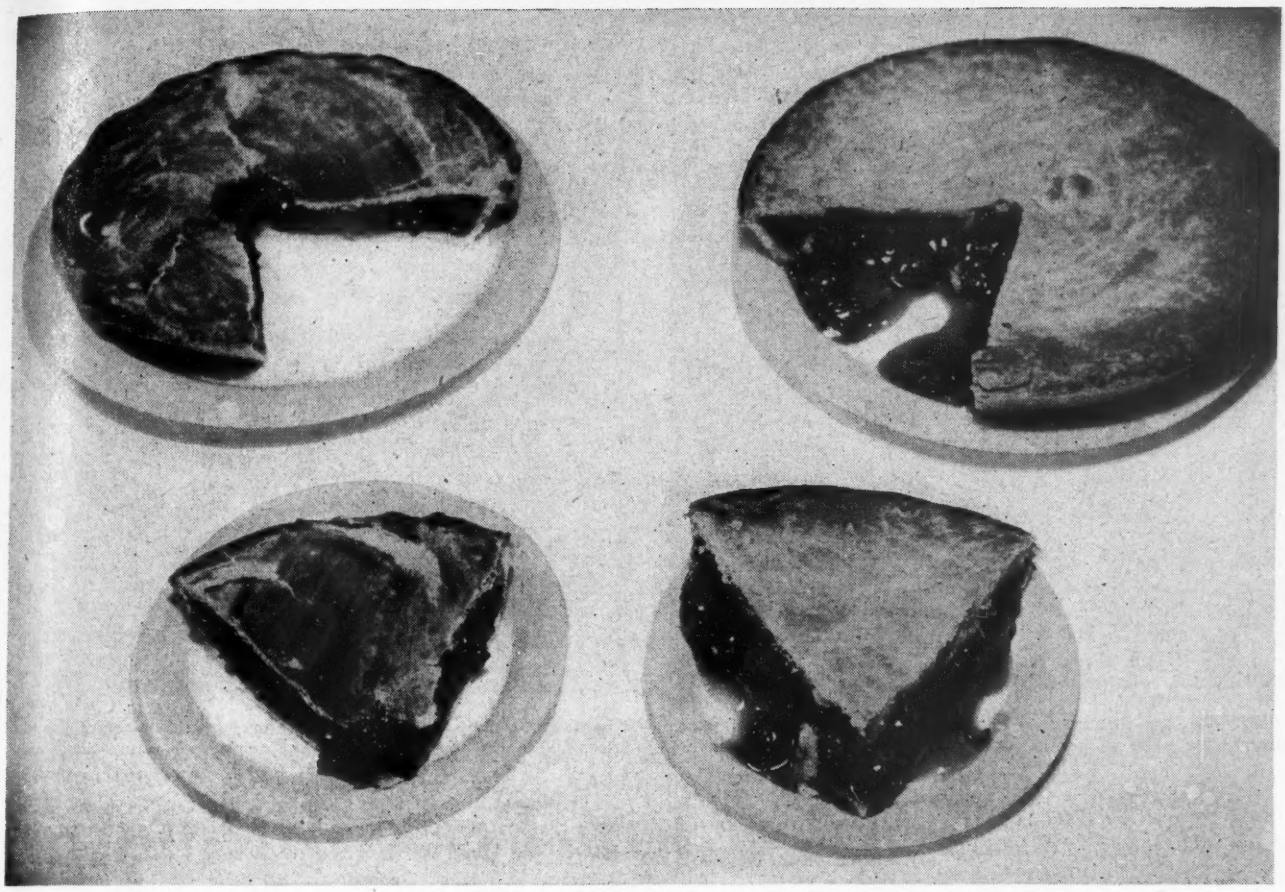
According to field tests, it will not cloud or "set" when used in cream sauces, clear gravies or a la king foods. It can also be used as a pure food dusting starch.

Because it does not set as firmly as other starches, it gives better chewing qualities to caramels and retards "sweating." Confectioners can obtain soft, tender textures in caramels, fudges, nougats and marshmallows with the product, which is unusually fine and smooth, and free from tendency to grain. It also retains moisture over long periods. To confectioners this means that food products made with this starch have considerably longer shelf-life and better eating quality.

What It Is

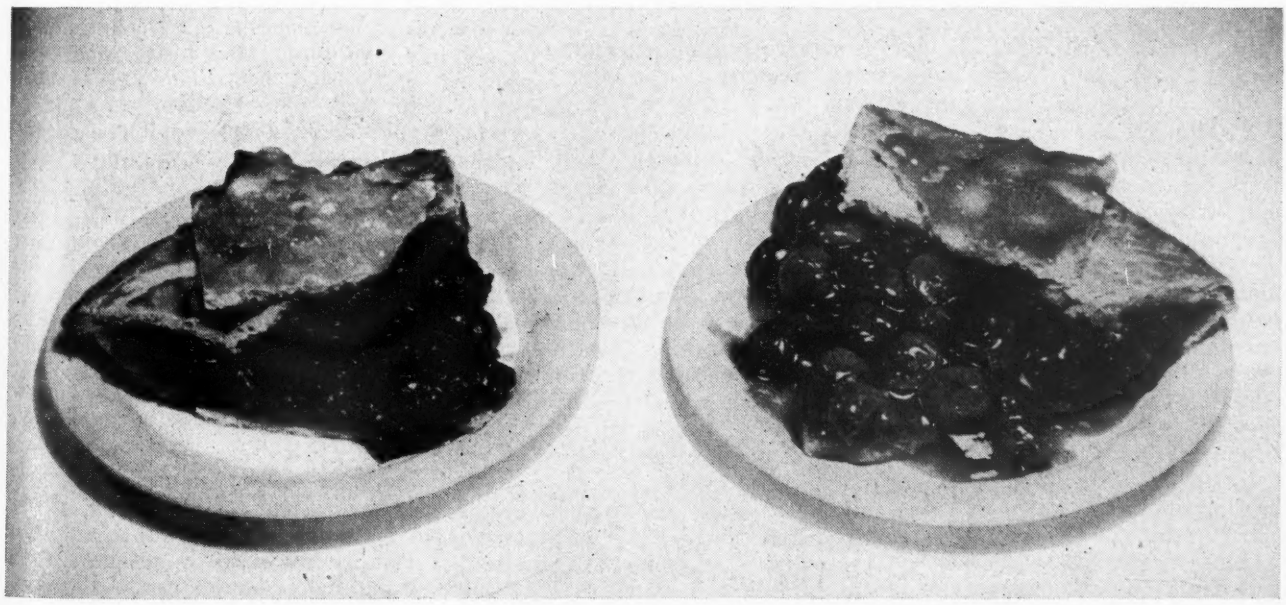
Clearjel is a modification of Amioca, the domestically bred waxy maize, and like Amioca, it is unique in that it consists entirely of amylopectin. Unlike Amioca, however, its pastes are non-cohesive. The specialty stabilizer also resists breakdown on prolonged cooking. In 12 parts of water it will cook to a smooth, heavy-bodied paste, bland in flavor, that is non-gelling and non-skinning.

Amylopectin is generally believed to be a more or less branched or non-linear polymer of glucose. Its molecules are highly hydrated and are unable to associate readily, giving rise to highly viscous, clear pastes, free from any tendency to thicken or gell on ageing. In comparison, other commercial starches, such as corn, tapioca, wheat and potato, contain about 20 to 30 percent amylose in addition to amylopectin. In pastes, amylose molecules tend to associate with each other and with the amylopectin molecules. This tendency leads to



CORNSTARCH PIE shows chunkiness and opaqueness which tend to detract from the appearance of the fruit in the pie filling.

CLEARJEL PIE has a soft creamy texture and clarity which set off the fruit to a better advantage than cornstarch pies.



FRUIT in cornstarch pie (left) tends to shrink and collapse on storage. Fruit shrinkage does not occur with Clearjel pie (right).

thickening, gelling and increased opacity.

These cherry pies, as illustrated, were commercially prepared and aged for 48 hours before the photographs were taken. The only difference between the two pies was that one contained Clearjel and the other contained ordinary cornstarch in the same proportion. The greater chunkiness, loss in brilliance and general appearance of pies made with ordinary cornstarch make them less appealing when compared with pies made with Clearjel. Consequently, pies made with the new starch stabilizer have not only better appearance when fresh, but they also have a longer shelf-life.

When flavors are compared, the Clearjel pie is richer, fruitier, and without a cereal off-flavor. Similar results can be obtained when the new starch is used in individual recipes, prepared by different bakers to meet local tastes.

Because the main characteristic of the new starch is its clarity, its full value is not realized when used in cream fillings, such as chocolate, lemon and butterscotch, where clarity is not important.

BRISLINGS are threaded on thin steel rods which are drawn through the eyes of the fish and then placed on wooden frames.

FRAMES are then placed in a continuous horizontal smoking furnace where the brisling sardines are smoked with oak wood.

Norwegian Food Industry

Aluminum is used, chiefly for sardines, because the metal is available.

By DAG NICKELSEN, A/S Nordisk Aluminiumindustri
Oslo, Lokkeveien, Norway

ALUMINUM cans were adopted by the Norwegian canning industry because extensive investigations showed that they were not only suitable for a number of that country's export products, but also superior to tinplate cans previously used for the same purpose. In addition, aluminum is principally a Norwegian product, while tin and, to a greater extent, tinplate are imported for the manufacture of tinplate cans.

A/S Norsk Aluminum Co. has its own aluminum plant at Hoyanger in the Soguefjord, north of Bergen, where pig aluminum is made from bauxite. The company has its own alumina plant and electrode factory. Its daughter company, A/S Nordisk Aluminiumindustri, operates Norway's only aluminum rolling mill.

Why Aluminum Cans Are Used

Many Norwegian products have a short shelf-life in non-lacquered tinplate cans, and they can be kept in lacquered cans for only a limited period. In lacquered and non-lacquered cans, foods may react with the cans and blacken them. At the same time a metallic and unpleasant flavor may be given to the product.

Seamed, rather than soldered cans, are used for Norwegian sardines. These cans have a lid with a lip and a weakening line. Cans are opened along this line with a special key. It is difficult to open tinplate cans in this manner. A strong hand is required and often lip ruptures occur, making further opening difficult.

Aluminum can also be readily rolled to sheet and coiled strip, and supplied in all tempers. It can easily be drawn and stamped to suitable sizes.

Some can manufacturing companies in this country have also been investigating possible uses of aluminum cans for packing foods. While they have found the use of aluminum cans is not practical from a cost and handling standpoint, they have not given up the idea of the possibility of using aluminum cans in the future. They will probably be used first for specialty products. Another FOOD INDUSTRIES special article, to appear in a forthcoming issue, will discuss some of the American and Norwegian experiences with aluminum cans.—The Editors.

Aluminum cans have eye-appeal and sales-appeal. They are easier to open than tinplate cans. If a special key is not available, a pocket knife can be used. Aluminum cans are also light-weight. An aluminum sardine can weighs 23 grams. Corresponding tinplate cans, on the other hand, weigh 65 grams. Inside blackening does not occur in aluminum cans, nor do the cans convey a metallic flavor to the canned food.

Limitations of Aluminum Cans

Aluminum cans are not sufficiently resistant to acid food products without special protection. Since they are softer than tinplate cans, more caution is required in handling them. Experience, however, has shown that this is of little significance. As indicated, it is an advantage in one respect. Cans are easily opened.

Since aluminum is more of a "dead" metal than tinplate, it does not withstand the internal pressure developed in the can during sterilization in retorts. Cans removed from ordinary retorts have a permanent swelled appearance, which makes them unsaleable. Consequently, a special sterilizing process

CUTTING HEADS off the smoked brisling sardines with special decapitating machines at United Sardine Factories, Bergen, Norway.

REMOVING the brisling sardine heads from the thin steel rods into a receptacle. The heads are subsequently discarded.

Packs In Aluminum Cans

Heat-saving over-pressure retorts compensate for internal can pressure

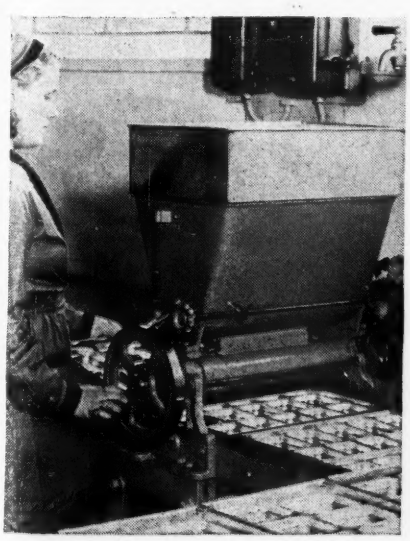
had to be used to prevent cans from swelling in the retort.

Over-Pressure Retort

Over-pressure retorts were constructed and introduced to the Norwegian canning industry to overcome this difficulty. A pressure is developed in those retorts during high temperature sterilization and subsequent cooling to compensate for the internal pressure in the cans. The total pressure used for ¼ dingley cans is 18 to 20 psi. This pressure is maintained during sterilization and cooling, until the contents of the can have reached a sufficiently low temperature.

Pressure is maintained with the aid of a steam reduction valve placed on the top of the storage tank (A/S Kvaerner Brug) or on the retort proper. An indicator adjusted to the desired pressure and operating the steam regulator also does an excellent job (patented by A/S Hamjern, Norway).

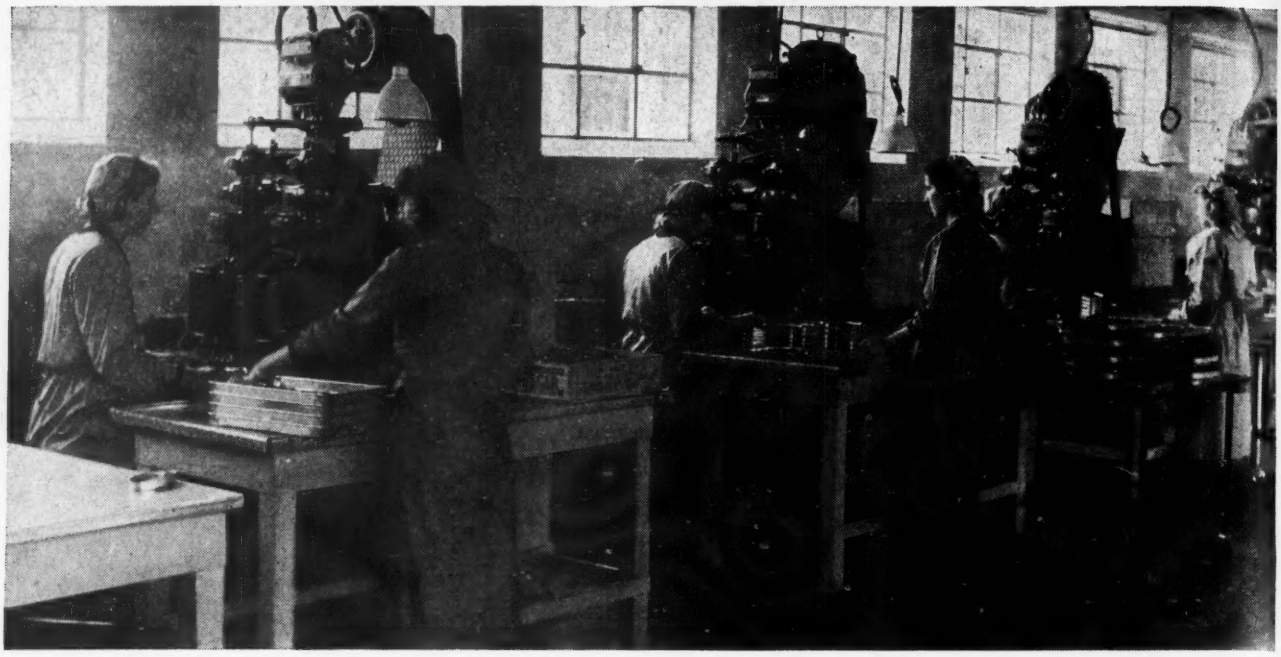
The last mentioned company has also improved an old idea which makes use of the movement of the can lids and bottoms when subjected to internal pressure. A number of cans placed on top of each other are located in a regulator house and subjected to the same conditions as cans in the retort



FILLING aluminum cans, ten at a time, with the prescribed amount of oil.

HAND PACKING brisling into aluminum cans. Chain conveyor carries the headless fish in trays to girls who are able to pack as many as several hundred cans an hour.

Aluminum Seams Must Be Perfect Because of the Properties of the Metal



SEAMING aluminum cans automatically. Machine seams 2,200 to 2,400 cans an hour. Seams are sealed with a rubber compound.

MACHINES are the same as those used for seaming tinplate cans. Seaming rolls must be especially adapted for aluminum seaming.

WRAPPING AND PACKING cans of brisling sardines in wooden boxes for export shipment. Cans have label insert and key opener.

proper. When an internal pressure develops within the cans, a small movement takes place in the can lids and bottoms. This movement is transferred to steam and water valves. When the internal pressure increases in the regulator cans, heated water is supplied to the retort to increase the outside pressure on the cans.

The most recent patented development of A/S Hamjern also makes use of the movement of the cans when subjected to pressure variations. The retort change represents the load on a balanced mechanical system. Variations in the buoyancy of the retort water, caused by the expansion or compression of the cans, actuates a regulating device which keeps the pressure absolutely constant. These two regulators are at present used only experimentally.

Over-pressure retorts which have facilities for rotating the charge and for circulation of the hot water under pressure represent the last improvements.

The over-pressure retorts have a capacity of 5,000 to 13,000 ¼ dingley cans per charge. Sardines are sterilized in ¼ dingley cans for 45 to 60 minutes at 230 to 234 deg. F. Cooling time is approximately ½ to 1 hour, depending upon the quan-

TABLE I—Products Packed in Various Types of Aluminum Cans in Norway.

Type of can		
Aluminum-manganese alloy cans	Anodized cans	Anodized and lacquered cans
Kippered herring (smoked fillets of herring)	Brisling in oil	Sardines in tomato sauce
	Sild sardines in oil	Spinach
	Shrimp	Asparagus
	Natural crab	Anchovies
	Crab paste	Meat products
	Fish balls	
	Cod roe	
	Fish cakes	
	Cod liver and roe paste	
	Mussels	
	Peas	
	Green beans	
	Mushrooms	
	Condensed milk	
	Meat products	

tity of cooling water available and its temperature. Cooled cans are then removed, and the retort is mechanically recharged in 15 min.

Over-pressure retorts can also be used with advantage for tinplate cans. Compared with the conventional retorts, over-pressure retorts are heat-saving.

A large, well-insulated, hot water storage tank is located above one or a number of retorts. During the cooling process, cold water is admitted into the retort and hot water is forced out of the retort into the storage tank. After the cans are cooled, the cooling water is tapped off and the retort is charged with cans. Subsequently, hot water is furnished to the retort from the storage tank. In this manner, hot water is saved and not flushed into the sewers as in the case of conventional retorts.

Kinds of Aluminum Cans

Three types of aluminum cans are used in the Norwegian canning industry. These are fabricated from aluminum-manganese alloy; anodized; and anodized and lacquered pure aluminum.

A number of food products can be packed in pure (unprotected) aluminum or aluminum-manganese alloy cans with satisfactory results. Storage tests, however, showed the necessity of surface protection in most cases, especially for several important export items.

Strengthening of the natural oxide film on aluminum was selected as the most satisfactory and economical method of protection. Lacquers or raw materials for lacquers must be imported. A number of export products can be safely packed in cans, made of anodized strip. If additional lacquering is necessary, it can be applied to the anodic coating with considerable advantage.

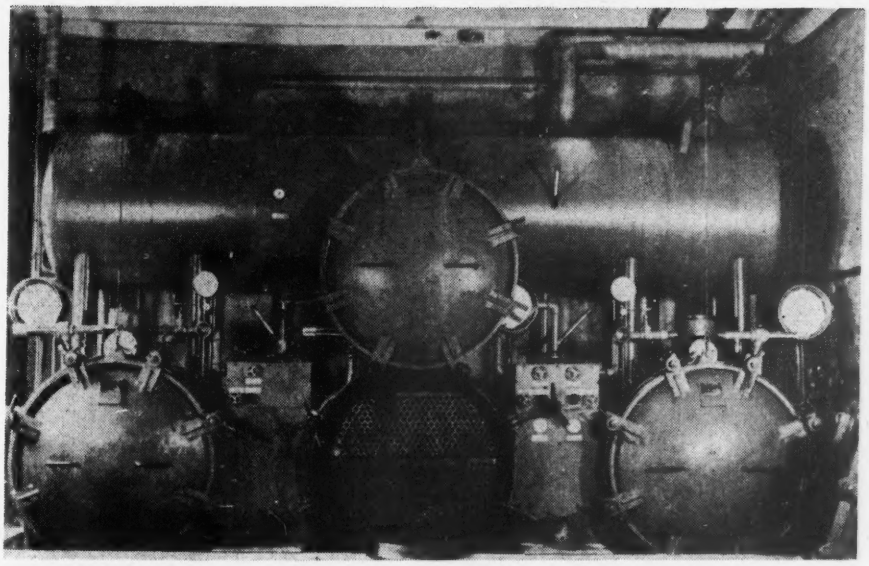
A number of different types and sizes of aluminum cans are on the market in Norway. A flat ¼ dingley can is used for brisling and sild sardines. Oblong types are used for kippered herring. A series of circular cans is also fabricated from the small 78x16 mm. crab can to the 0.9 liter packers' can, with a diameter of 137 mm. and a height of 67.5 mm. All cans have corrugations to add to the strength of the cans and to give aluminum cans a distinctive appearance.

The rolling mill of A/S Nordisk Aluminiumindustri at Holmestrand supplies the anodized coiled sheet, either directly to the canning factories or to the can making companies. These companies stamp the cans in automatic presses at a rate of 8000 sardine cans per hour. Rubber rings have up until now been used for tightening the seams. A Dewey and Almy type "soluble" rubber compound or similar compounds will hereafter be automatically applied to the lids.

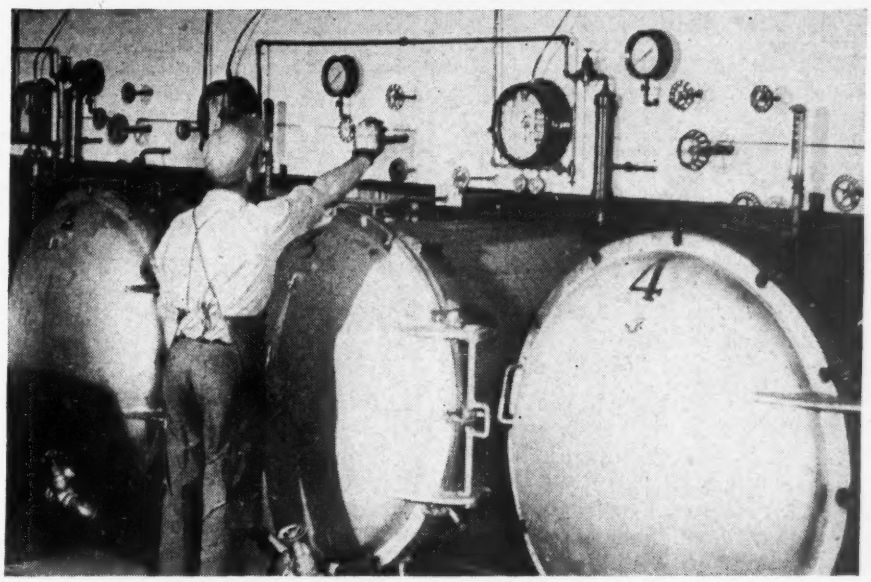
At present, the cost of sardine cans in Norway is one dollar more per thousand than tinplate cans.

After the war, complaints were received by the New York City Health Department on Norwegian sild and brisling sardines packed in aluminum cans. A small number of people claimed illness as a result of consuming these sardines. An embargo was placed on about 1000 out of 100,000 cases imported.

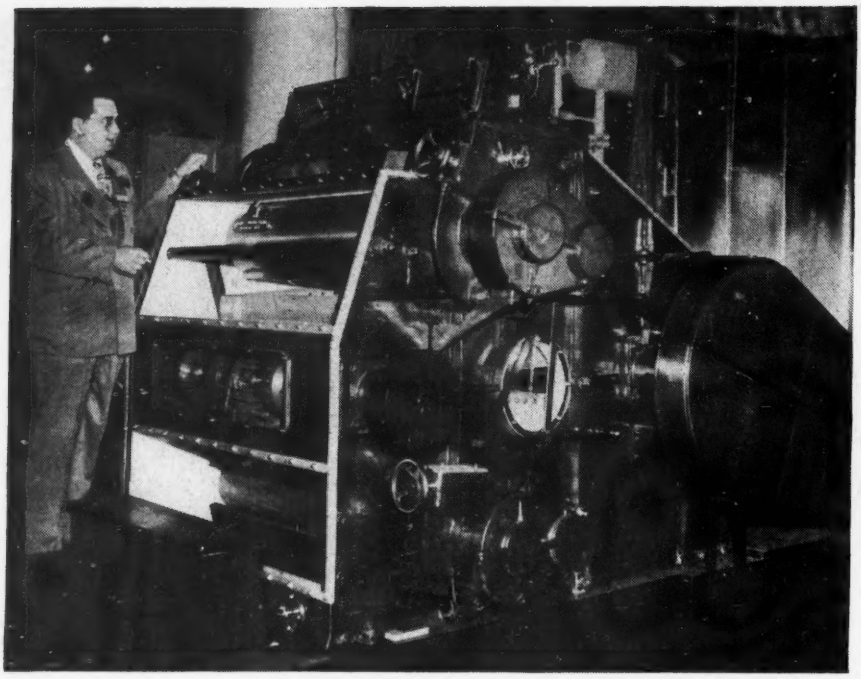
This complaint was investigated and nothing was found to prove the alleged poisoning. Of the 1000 cases, a certain percentage showed leakage due to imperfect seaming. Poor seaming was traced back to excessive wear of the seaming machines, attributed to wartime conditions.

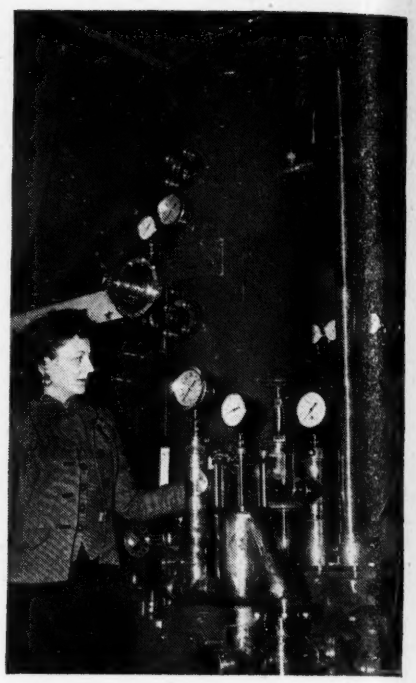


OVER-PRESSURE RETORTS were constructed and introduced to the Norwegian canning industry to prevent cans from swelling during sterilization and subsequent cooling.



ORDINARY RETORTS are used to sterilize sardines that are packed in tinplate cans in California. Here the operator is starting up one of the retorts in this battery.





Press Association Picture

SIX ROLLER MALT MILL interests Rudy Bender, Hoboken, N. J., while another visitor examines DE MARKUS MULTISTAGE CARBONATOR.

Brew Masters Visit Cleveland

Grain supply problem, improvements in equipment, new ways of utilizing yeast engage attention of 3,000 at meeting of Master Brewers Association of America

RECENT developments in the commercial utilization of brewers' yeast and the outlook in supplies of raw materials drew the attention of more than 3,000 master brewers and other members of the brewing industry, at the 60th annual convention of the Master Brewers Association of America, at the Public Auditorium, Cleveland, in October. Coinciding with this meeting, the first postwar International Brewing Industries Exposition staged a review of brewing materials and equipment with about 130 exhibitors participating. The extent of interest in American made brewing machinery was evidenced by the presence of nearly 100 foreign brewers and brewing technologists from all over the world, including Australia, Denmark, Sweden, France, Central and South America, Mexico, Canada, China and India.

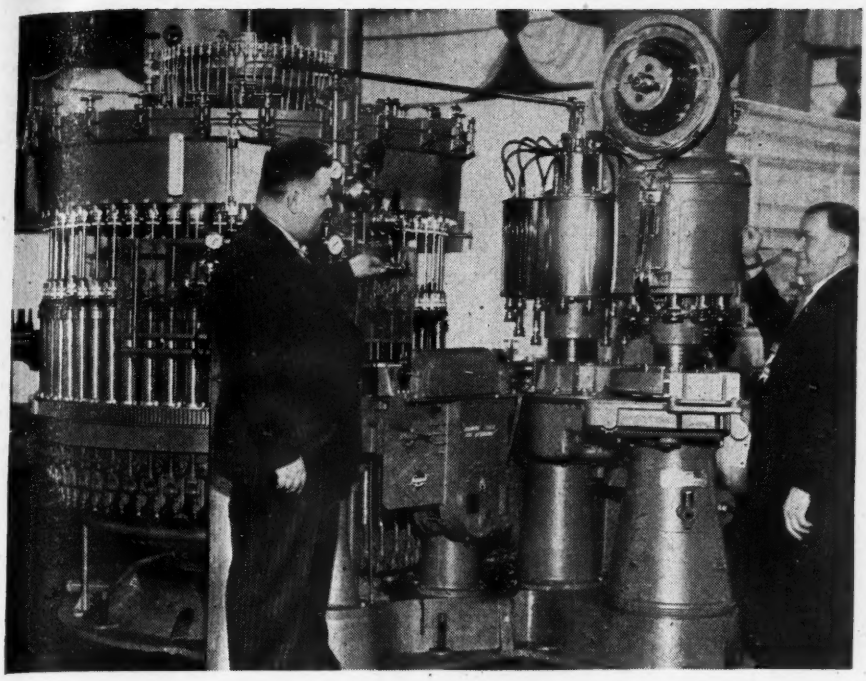
The successful development of a dried brewers yeast suitable for incorporation in bread for its nutritional values was reported by the Brewers Yeast Council. This type of yeast, which does not impair loaf volume and crumb texture, due to a special treatment prior to drying, is the result of years of cooperative research between the QM Food and Container Institute for the Armed Forces and Haffenreffer & Co., Inc., Boston brewers, and members of the council. Investigations are now in progress at the Food and Container Institute's laboratories to study its possible incorporation in foil wrapped bread, that will retain freshness for months.

Other Yeast Forms

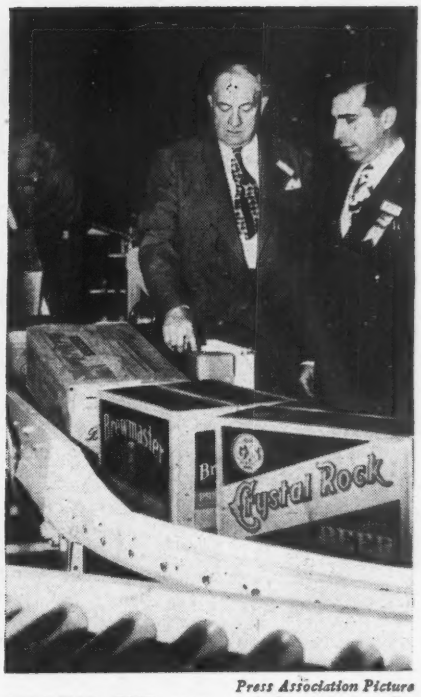
Brewers were also reminded of other palatable forms in which their byproduct, yeast, is being utilized in today's markets and the far greater possibilities to be explored by the Brewers Yeast Council's research program. Among the samples of processed brewers yeast on exhibit was a powdered yeast with hickory smoked bacon flavor recommended for flavoring in cheese, salad dressings and casserole dishes, and a celery flavored dried yeast. There were also a bouillon in paste form, half a teaspoonful of which will make a six ounce cup of soup, crackers containing about 2 percent dried yeast, plain debittered brewers yeast for use in various food products and pharmaceutical products derived from brewer's yeast.

The rapidly growing shortage of grains is one of the principal concerns of the brewers. With the corn supply about 900,000,000 bu. below the 1946 crop and the increased domestic supply of barley more than offset by the much larger percentage earmarked for other food uses, as well as by the halt in imports from Canada, the brewers' grain outlook is far from bright. Included in this picture, of course, is the industry's compliance with the government's request to reduce the use of corn by 25 percent and to eliminate the use of sorghum grains, and rice, as well as of edible barley for three months beginning November 1st.

The 1948 crop of malting barley is expected to reflect the Midwest Barley Improvement Association's plan to stimulate the growing of improved malting barleys. Prizes totaling $30,000 are being offered by the association to encourage the increased production of high quality malting barley in Wisconsin, Illinois, Minnesota, Iowa, Michigan and North and South Dakota. Only varieties approved by the Association will be eligible to compete.



MACHINERY MEN Fred Kaltenhauser and John Miller, of Liquid Carbonic Corp., Chicago, demonstrate their giant combination beer filler, gasser and crowner.



Press Association Picture

ELECTRIC EYE case switch attracts St. Louis brewers N. S. Keener and E. F. Felber.

BREWERS YEAST COUNCIL exhibit included display of edible yeast products, attracting increasing attention as ingredients for use with many different types of foods.

Press Association Pictures

FRENCH BREWER R. H. Dian (R) meets J. A. Bohannon, Brewing Corp. of America.

Thus, by the planting of certified seed, the association hopes to produce an improved barley better suited for malting and brewing purposes.

Plant breeders and agronomists in these seven states have been working closely with the brewing and malting industries to develop new barley varieties by crossing and hybridization. Research at the University of Wisconsin has developed a hybrid that is now in its ninth filial year. Experimental tests have shown this barley to have superior characteristics with respect to disease resistance, stiff straw, early maturing, etc. Pilot plant tests show excellent brewing and malting properties for this hybrid. A sufficient supply was produced this year to permit testing on a commercial scale during the winter.

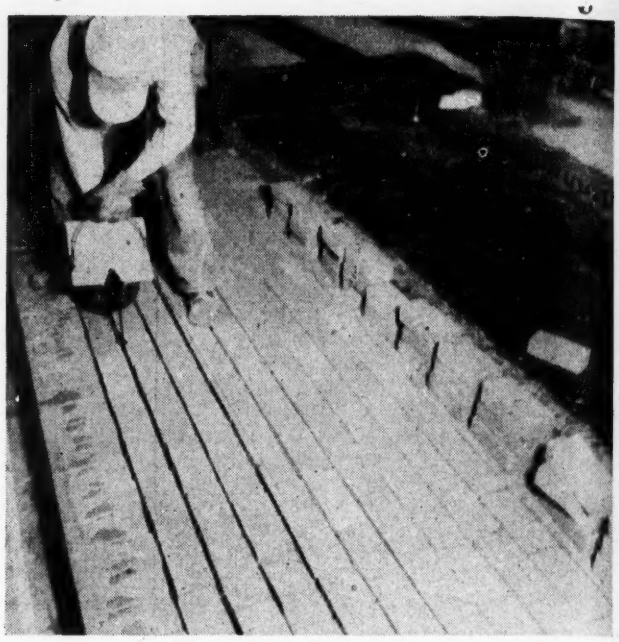
No expense was spared by industrial exhibitors at the exposition to offer for the brewmasters' close inspection the latest in conveyors, barrels, cappers, strainers, labelers, pasteurizers, bottle washers, glass lined storage tanks.

Although no major changes have occurred recently in the design of brewery equipment, many minor improvements have been made and additional safety factors incorporated. Stainless steel, not obtainable during the war and still in scarce supply is, wherever possible, replacing copper and other metals. A hop strainer, on display in the Wittemann Company's booth, and which was completed just a few weeks before the exposition, is the first of its kind to be constructed entirely of stainless steel. This attracted considerable attention, not only because it is more easily cleaned and more sanitary than the old model, but also because it exceeds the previous model by cutting the time required for the straining operation, normally 40 to 50 minutes, to 20 to 25 minutes, at a maximum capacity of 45 barrels per minute.

Liquid Carbonic Corporation

(*Continued on page* 219)

BRICK or tile are laid on concrete which is finished to grade, properly pitched to drain and covered with a layer of asphalt.



JOINTS are made by pouring molten sulphur cement into them until they are overfilled. Excess cement is chipped off after cooling.

Better Floors For Food Plants

When joined with cement that is acid-proof and alkali-resistant, brick or tile

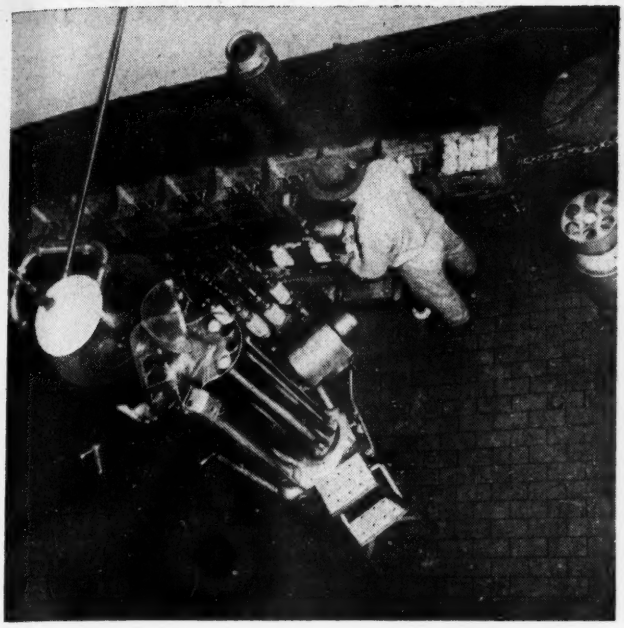
By WALTER L. SHEPPARD, Jr., Engineer
The Atlas Mineral Products Co. of Pennsylvania, Mertztown, Pa.

HARD-BURNED shale or fire clay brick and tile have shown in actual service over many years that they are proof against, not merely resistant to, all acids and alkalies found in food plants. It follows, therefore, that such brick or tile would make the ideal food plant floor if a cement could be found that is just as acid- and alkali-proof as is the tile.

Brick or tile floors installed with joints of Portland cement or compounds of aluminum have the same drawbacks as floors composed entirely of these materials. Although a careful selection of aggregate and mix to obtain the densest possible concrete, followed by a hardening treatment, or the addition of iron filings, contributes greatly to floor life, there is no way to make a mix-

BAKERIES use brick floors where cakes and confections are made, in aging rooms for fruit cakes and in refrigeration rooms.

CANDY FACTORIES find acid resistant floors advantageous in their cooking rooms for long life and ease in cleaning.



RIGHT WAY. Acid proof, alkali resistant, attractive, long wearing floor in bottling room of this dairy will remain in good condition.

WRONG WAY. Portland cement joint eaten away by food acids and alkali cleaners. Bricks are chipped and spalled by wear.

With Acid-Proof Brick or Tile

floors are attractive, long wearing and unaffected by food or cleaning agents

ture containing Portland cement acid-proof. Neither can a mixture containing silica aggregate or silicates be made alkali-proof. Joints containing these materials retard but do not prevent acid attack.

Such a floor gradually loses its joints. Heavy traffic causes chipping, cracking or spalling of the brick or tile, especially at the edges near the low joints; food particles and liquids penetrate the joints and form breeding places for bacteria, resulting in further deterioration, objectionable odors and unsanitary conditions; food acids and cleaning solutions leak through the joints to building structures; production time is lost due to rough floors and required maintenance.

Floors of acid-proof brick or tile with this type of joint will require repair, or at least pointing in the joints, an average of once a year, frequently more often.

Two Proven Cements

There are two types of cement known at the present time that can be said to be proof against the acids and alkalies to be found in food industries. These are sulphur cements such as Tegul-Tileset and Tegul-Vitrobond, and the synthetic resins such as Alkor, Korez and Carbo-Korez.

The oldest type is the sulphur cement. Floors of this type have been in service in food plants continuously and without maintenance for well over a decade. They are generally laid by one of the following methods: A concrete sub-base is finished to grade, pitched properly to drain, and trowelled smooth. Over this base a waterproof membrane is laid. This may be composed of ⅛ to ¼ in. hot melted, high temperature asphalt properly filled, or of layers of impregnated water-proof materials. The former type is usually preferred since there is then no fiber or fabric to act as a wick, transferring moisture by capillary action from the face of the membrane to the sub-base.

The brick or tile may be laid directly on this membrane, leaving ¼ in. joints between them. The joints are then filled by pouring molten sulphur cement into them until they are overfilled. The cement hardens at once on cooling. Excess cement may be chipped off the face of the tile or brick with brick hammers, or the joint may be left as it is and the excess permitted to wear off under traffic.

The alternate method would be as follows: Lay your sub-base and finish off as indicated above. Either with or without the waterproof membrane mentioned, bed the brick or tile in a 3 to 1 stiff, dry mix of sand and Portland cement, and pound to level. Then pour the ¼ in. joints as before.

Long-Lived Floors

Floors of this type are long-lived, sturdy, and completely unaffected by foods and cleaners. They are durable and utilitarian. However, their attractiveness is directly proportional to the amount of time and effort expended on smoothing the rough joints. Over a period of years the joints wear smooth and the appearance improves greatly. Only by ironing the joints with a hot iron may they be made smooth at the time the floor is laid.

If resin base cements are used, a highly finished and attractive floor may result. They are formed

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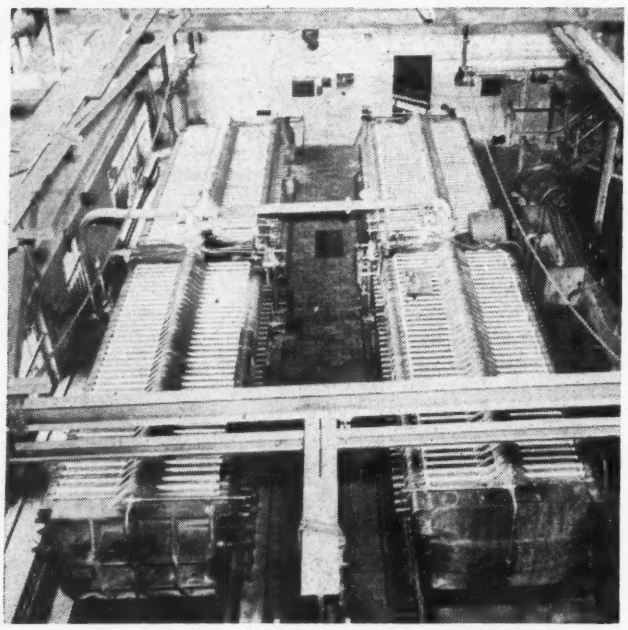
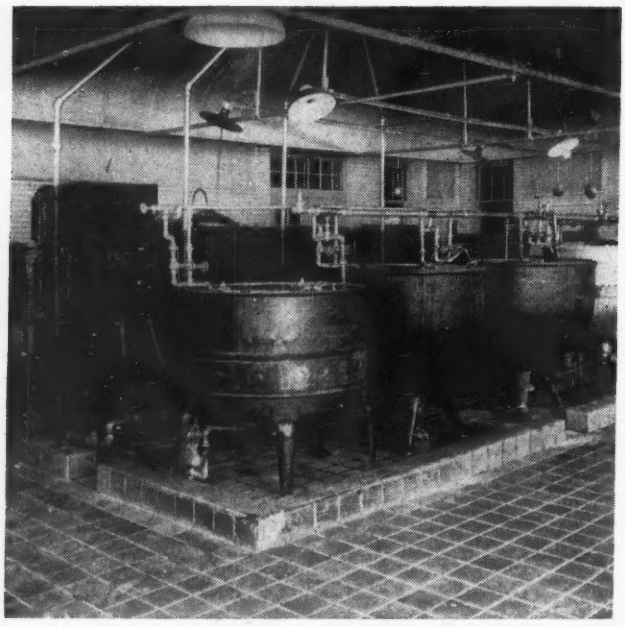
This is a companion article to "Designing the Proper Concrete Floors for the Food Plant" which appeared in the July, 1946, issue of FOOD INDUSTRIES. There are many situations where either concrete surfaces or cemented joints may be attacked by food acids or by alkaline cleaning agents, despite the use of the best materials and the best procedure on the part of the contractor. The author of this month's article tells how to lay floors of hard-burned shale or fire-clay brick and tile that are proof against the acids and alkalies often encountered in food processing.—The Editors.

Hard-Burned Shale or Fire Clay Brick and Tile Are Extensively Used in Food Plants

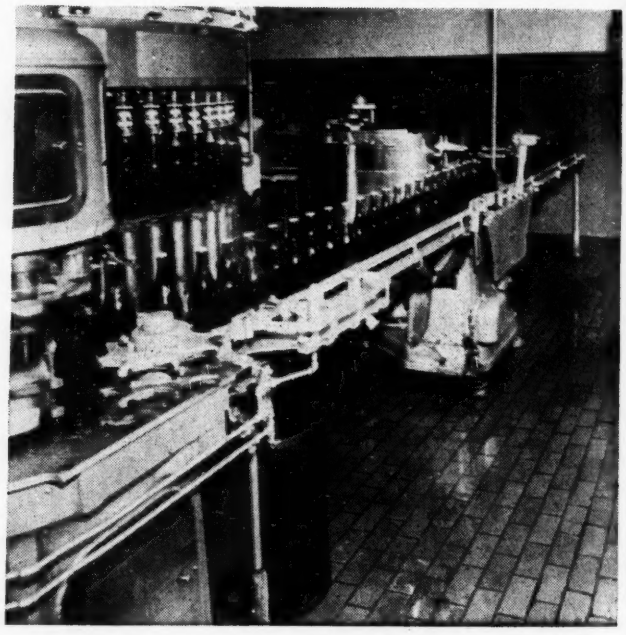


BREWERIES use floors of brick, joined with resin cement in mash, cooler and bottling rooms. Floors like this will have indefinite life.

PRESERVE manufacturing plants find that sulphur cement brick floors are resistant to fruit acids and to alkali cleaning solution.



INSTITUTIONS. Properly laid tile floor under kettles in hospital kitchen is durable. Cement mortar on curbing has deteriorated.



SOFT DRINK MANUFACTURERS use brick floors in their bottling rooms and sirup making departments with resultant long service.

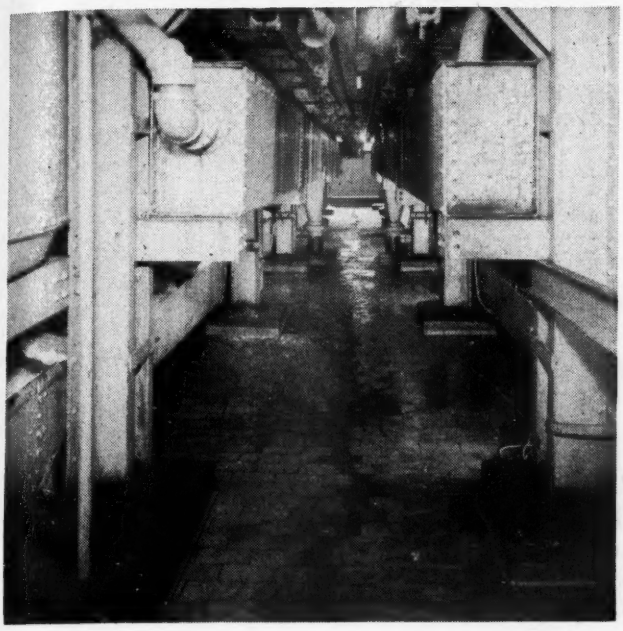
by mixing a liquid resin binder with a powder on the job. The cement may then be buttered on the brick or tile and the brick or tile laid in place directly on the waterproof membrane, or the brick or tile may be bedded, as indicated above, in a stiff, dry 3 to 1 cement mix, and the joints pointed with the resin. Effort here should be directed to reducing the joint to ⅛ or 1/16 in. since the resin is expensive and the smaller the joints, the less the expense.

The joint may be smoothed with a trowel and any excess over the face of the brick or tile may be removed with a damp rag, employing a circular motion. This removal of excess must not be made until the cement has started to set, approximately one to two hours after the joints have been filled. Care must be taken not to drag materia' from the joint itself.

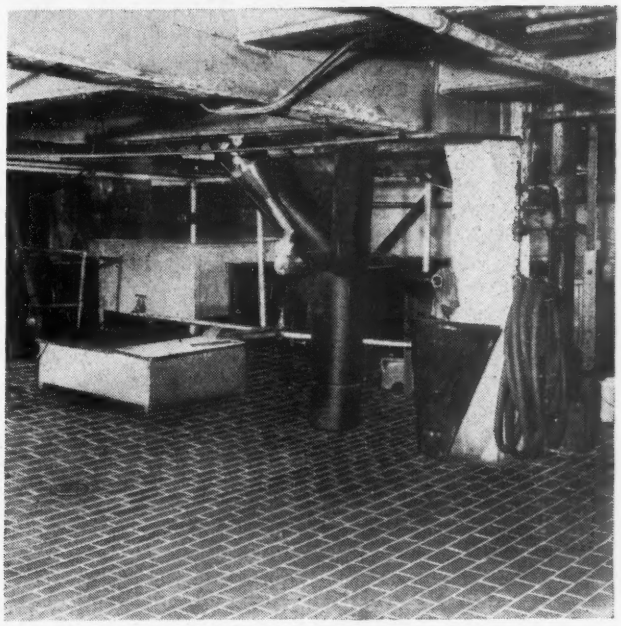
An alternate method of applying resin cements to obtain attractive floors is by bedding the tile or brick in a stiff dry 3 to 1 Portland cement grout, leaving about ¼ in. space between tiles. Depth of joint should be the full depth of the tile. Tile are tamped level and lined up very carefully. Joints are then painted with 5 percent HCl to neutralize the Portland cement and to remove any of the cement adhering to the bonding surfaces. The resin cement is then screeded into the joint, either by use of a stencil or by working it in with a trowel. A thin mortar may not be used. After the joint is filled, the trowel is run along the edge of the joint to remove trapped air, and the surface finished as before.

The setting time of resin cements is affected by temperature. In a warm room they set fairly rapidly, becoming hard to the touch in a matter of hours. Normally a floor

Brick Floors, Made with Proper Joints, Are Durable as Well as Attractive in Appearance



SUGAR REFINERY. Acid proof floor of brick with resin joints resists the corrosive action of sweet liquors as well as byproducts.



PACKING HOUSES. Brick floor in lard rendering room has been in service since 1936 without the need of any maintenance.

TABLE I—Physical Properties of Cements.

Properties	Cements—Sulphur	Resins
Adhesive strength, psi.....	500	500
Tensile strength, psi.....	600	1,000
Compressive strength, psi..	6,000	10,000
Absorption, percent of weight	0.52	0.75
Coefficient of expansion	8.3×10^{-6}	$6.1\text{-}6.5 \times 10^{-6}$

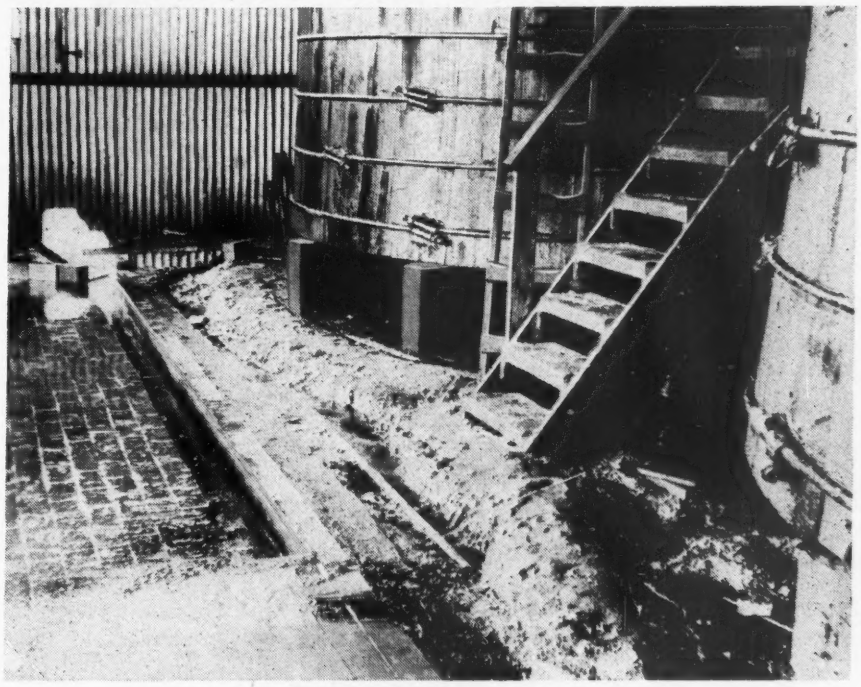
composed of brick or tile with a resin cement joint is ready for service in two days from the time the last tile or brick is laid. Cure is hastened by swabbing the floor with a dilute solution of HCl.

Floors of this type can be made as elaborate and attractive as the user wishes. They are absolutely proof against food acids and cleaners and have an indefinite life.

Tile vs. Monolithic Structure

Many engineers and architects have asked, "Why bother with the brick or tile? Why not make monolithic floors with these cements?" There are many answers to these questions. Possibly the best answer is price. To make a monolithic floor of either sulphur cement or resin would be to expend a tremendous sum of money. Trowelled surfaces and skin-thick applications are not sufficient. They wear through and expose the concrete sub-base far too quickly. The cost of the cement is diluted and brought within economic bounds by the use of floor brick or tile and an attractive floor is the result.

There are some additional factors to be taken into account. In large areas, resins and sulphur cements will tend to crack or craze due to shrinkage on curing or cooling. In addition, these materials do not lend themselves well to trowelling or handling as cast surfaces in the manner in which ready-mixed concrete is handled. Any attempt to "stretch" the cement by diluting it with sand or other aggregate, including emery, iron filings, or other items, will only decrease its chemical resistance. Such fillers are definitely not acid-proof and will destroy this quality in the cement.



EDIBLE OIL PLANT. Brick floors, joined with resin cement, withstands oil that caused concrete to soften and swell. Tanks have now been moved and the entire floor built of brick. Similar floors are in service in the largest soap factories.

Certain manufacturers have produced thin sheets or tile made of resin cements, using glass cloth or other material as a filler. Such tile and sheets are sometimes used in chemical laboratories or in special applications but are so far not commercially practicable for industrial floors. The cost of laying such a floor is comparable to that of laying a brick or tile floor. Regular brick and tile are far cheaper, just as satisfactory chemically, and

(*Continued on page* 221)

1. SEEDLINGS are carefully cultivated in the Philippines, requiring from ten to twelve years to reach maturity.

2. COCONUTS are harvested with long, knife-ended bamboo poles, from the matured palms, which bear about 75 years.

Coconut Stages A Comeback

General Foods unit rebuilds bombed out plant in Philippines, where the nuts are processed for shipment to the company's Hoboken plant or to other industrial users. These pages depict the operation from plantation to package

STEADILY increasing supplies of packaged coconut for both industrial and consumer uses may be expected during 1948. One of the principal reasons for this improved outlook is the resumption of operations at the Franklin Baker desiccated coconut plant at San Pablo, some 50 miles south of Manila. Bombed out in late December, 1941, this unit of General Foods has been completely rebuilt in the two years since the war's end. Return of coconut to the market verifies forecasts made by McGraw-Hill World News in FOOD INDUSTRIES last year.

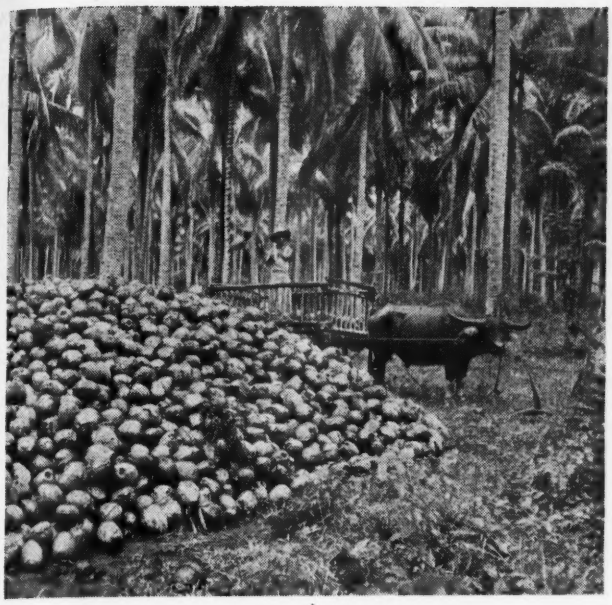
This picture story includes photographs made in the Philippines when the first production was going through. The prints were flown back to New York. The pictures illustrate the gathering of the coconuts and show various steps in the processing operations. Some of the work is done at San Pablo, some at the company's Hoboken plant.

The Hoboken plant receives both shredded coconut and whole nuts. The material in production at any time is dictated in part by market conditions and in part by the type of product in which it is to be used.

Moist shred or processed coconut is one of the company's direct consumer items, packed in cans and trademarked "S o u t h e r n Style." Shredded coconut is also packaged for the consumer market in boxes.

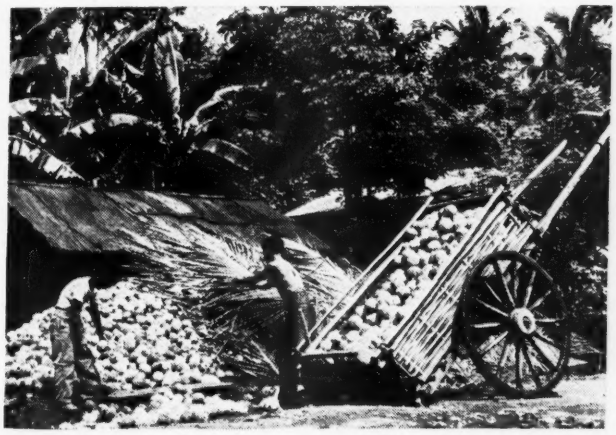
7. ACTUAL PROCESSING begins with the removal of the shell, after which nuts are dropped in chute and carried to parers.

8. SPECIAL KNIVES are used to pare every speck of the nut's innermost covering, a job that defies mechanical operation.

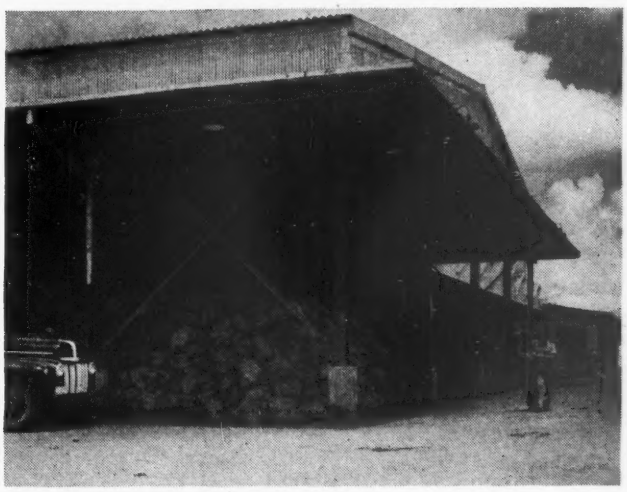


3. THE NUTS are next carried to convenient locations by ox cart where they are piled to await the huskers.

4. HUSKING is done right on the plantation as part of the harvesting operation, using primitive equipment.

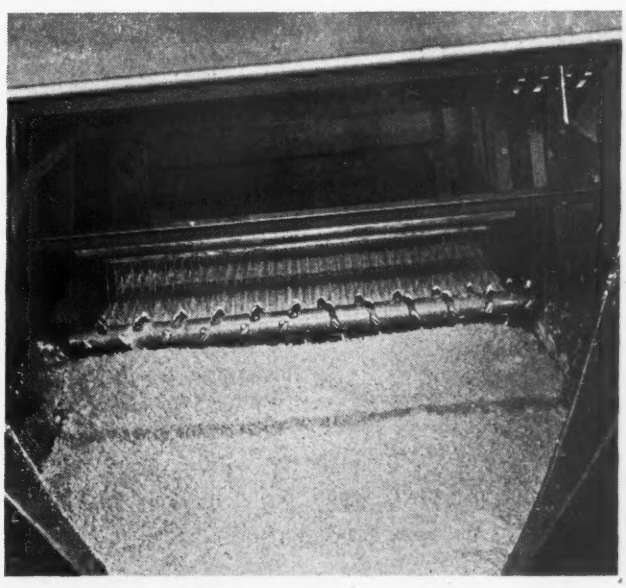


5. HUSKED COCONUTS are then carried, again by ox cart, to roadway shelters to be picked up by company trucks.



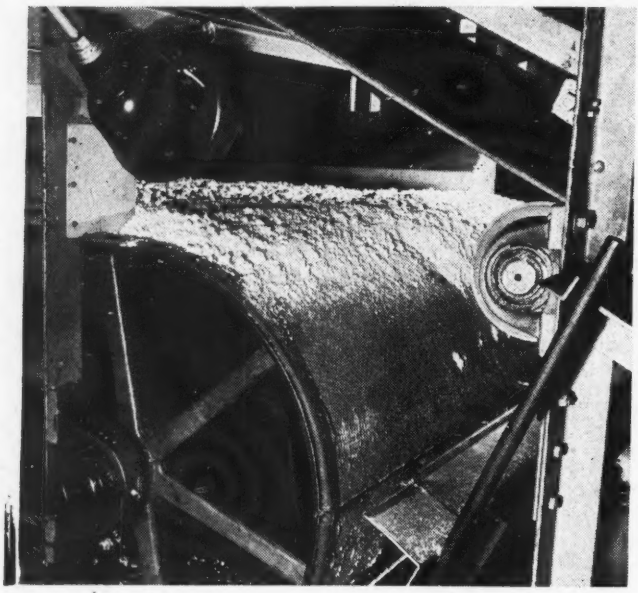
6. UPON REACHING the Franklin Baker plant, the nuts are immediately bagged for more convenient storage.

9. AFTER PARING, the nuts are rolled (upper left) to the shredders from which they emerge in the familiar "thread" form.



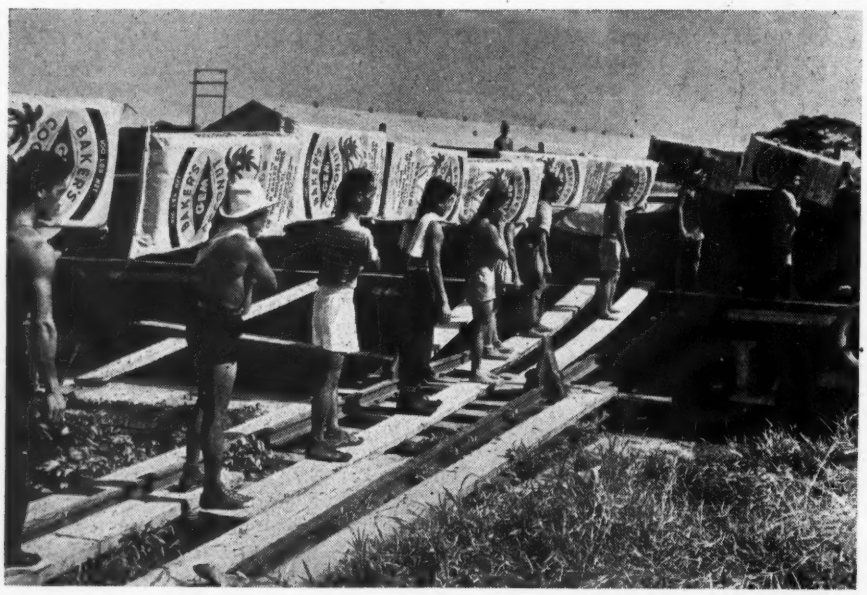
10. SHREDDED COCONUT is now sent to the steam coil drier, where it makes two passes on a slow moving belt.

The Shredded Coconut Is Made Ready For Shipment



11. DRIER DISCHARGES the coconut at this point. Grade depends on type of grinder or on size of sieve.

12. MEDIUM AND MACAROON grades from the attrition or devil mills, are shown at left. Thread is on right.

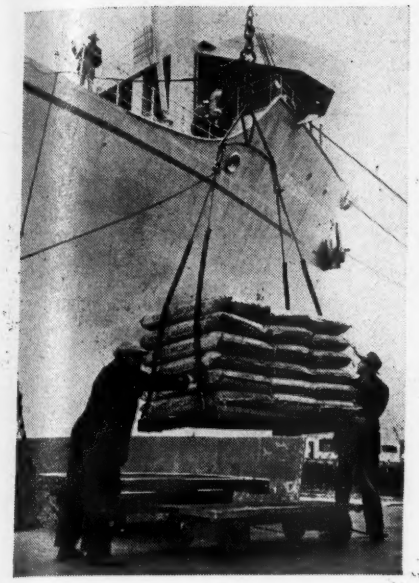


13. FINISHED COCONUT (above left) is forked into the receiving bin, which tips it into the filling machine. Pressure is then applied to compress the material, which then goes into the bag.

14. FILLED with the designated grade of coconut (above right), these 100 lb. multiwall, glassine-lined bags are ready to leave the Philippine plant on the first leg of the journey to the U. S.

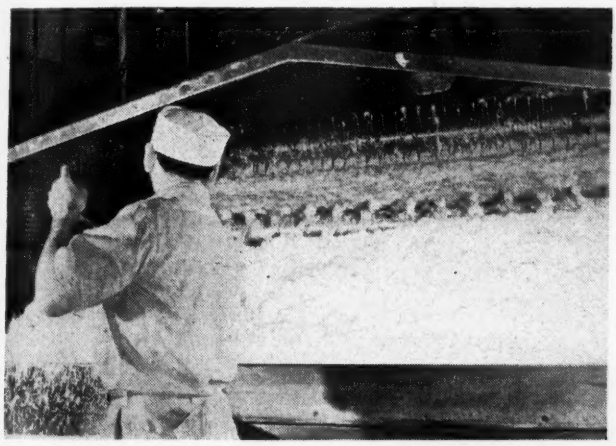
15. LOADED onto a lighter, which carries it to the freighters, the coconut is now on its way either to the company's Hoboken plant or to distribution points for reshipment to other processors.

Processing For Canned and Box Packs Is Done at Hoboken



16. BAGGED coconut reaches Hoboken ready for final processing.

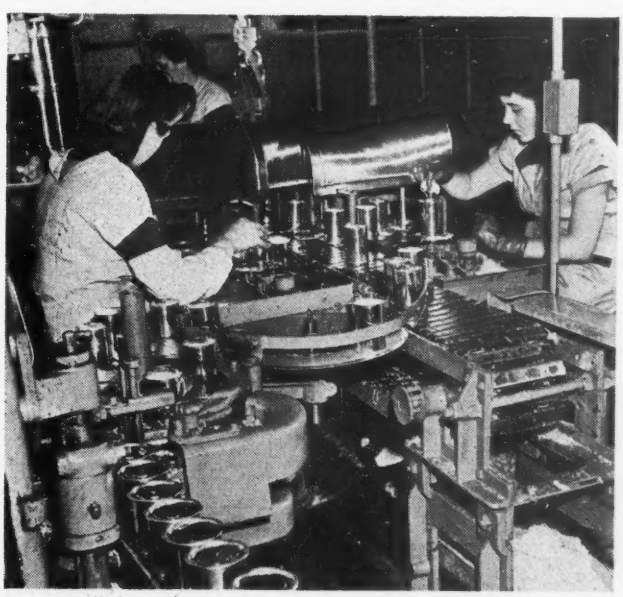
17. SUGAR, glycol, salt and enough water to dissolve them are added to the coconut in steam jacketed pans. Glycol permits higher moisture in finished product.



18. MATERIAL is now redried to remove the excess water that remains after the mixing operation.

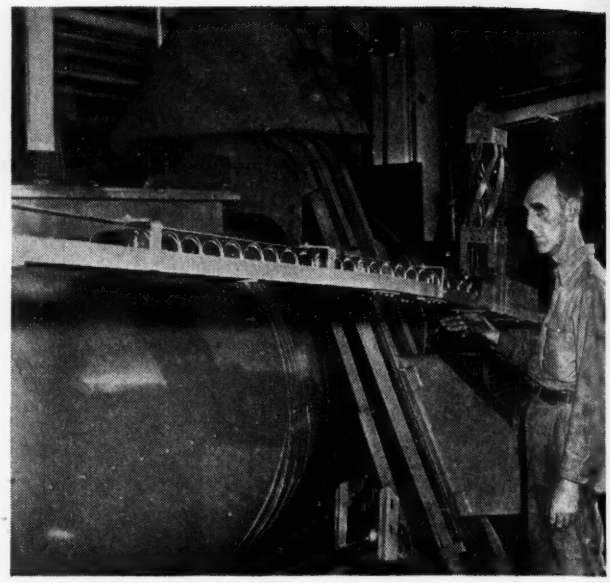
19. REDRIED coconut is then deposited in storage bins, ready to be dropped into chutes leading to the fillers.

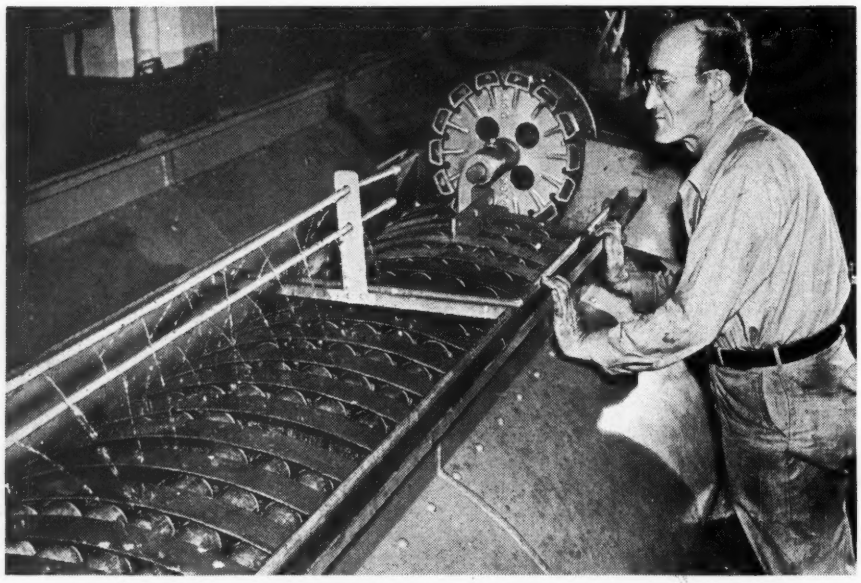
20. CANS enter revolving filler from right, the coconut through center chute. Filled cans then go to checkers.



21. GIRLS CHECK the fill as two lines of cans are conveyed toward closing machine, where they are loosely topped.

The Packaged Coconut Is Made Ready For Distribution





22. LOOSELY TOPPED cans are then vacuumized and the air replaced with CO_2 after which they are conveyed, as shown above left, from the gasser to the top-sealing machine for closing.

23. SEALED CANS are next rolled down to the retort as can be seen, above right. They are passed through this continuous retort. After processing, cans emerge ready for the cooler.

24. FROM THE RETORT the hot cans are passed to the cooler alongside, left, where streams of cold water are played on them from the pipes above, thus preventing harmful cooking action.

25. PROCESSING is now completed and the cans of coconut are rolled to the packaging room.

26. COCONUT for the box line comes direct from bin to filling, sealing and cartoning section, shown here.

EDITORIALS

COMMENT AND OPINIONS

The Marshall Plan and Food Prices

THE MARSHALL plan—discussed editorially in November FOOD INDUSTRIES—is comprehensively analyzed in a special section of this issue. The report, prepared by the McGraw-Hill department of economics, is an appraisal of the general significance of the program for American business.

The story is a vital one for all readers of FOOD INDUSTRIES—as businessmen, as food plant executives, as average consumers. The plan will help hold business at a high level, but does not constitute a general inflationary pressure. Food prices, then, are not likely to fall in 1948—they may rise. For the basis for this conclusion, see the December supplement.

Cost of Spoilage of Perishables

WASTE and spoilage cost 7.4 percent of the value of fresh fruits and vegetables sold in self service food stores, according to a government survey made in a number of stores of American Stores Company, Philadelphia.

Annual rate of loss for 45 out of 65 perishable items exceeded 5 percent. Highest loss was with persimmons at 45.7 percent, followed by blackberries, 34.3, and strawberries, 28.

Data from two stores equipped with refrigerated display cases showed losses of only 2.7 percent.

Quantitative data of this sort are often exceedingly difficult to acquire, yet without them one cannot easily gage progress and improvement in distribution.

Hydrogen Peroxide as Milk "Preservative"

HYDROGEN peroxide is being used in Italy to sterilize milk, according to a report (OTS-813) recently released by Office of Technical Services.

"Addition of 0.1 percent by weight of 39 percent hydrogen peroxide results in sterilization in about 8 hours and lasts for at least three days."

We cannot refrain from further quotations:

"A recent development, not yet used commercially, is the production of a solid hydrogen peroxide-urea addition compound (35 percent hydrogen peroxide, 65 percent urea) to be used in tablet form, one tablet to sterilize 25 kilos of milk. Since urea likewise has antiseptic properties this material is expected to be even more suitable than the liquid hydrogen peroxide," the report states.

"If the principle is found sound, the investigator believes, and if the practice is not contrary to American pure food laws, it would seem desirable to introduce this practice into the United States."

Several comments suggested by the foregoing are: (a) The investigator knows very little about food technology; (b) A "sterilizing agent" that requires 8 hours to be effective and lasts only 3 days does not produce sterility and is only a poor bacteriostatic agent. All the normal American sanitary precautions would be needed, including refrigeration, to keep the milk sweet before the peroxide was able to stop the living bacteria. No obvious economic gain is foreseeable; (c) Very few state food laws permit hydrogen peroxide as a preservative; (d) It is not a new preservative; (e) As a "something new has been added," urea is not a valuable addition to milk.

The Coming Depression (?)

ONE of the best sellers among books is "Cycles—the Science of Prediction" by Dewey and Dakin. It calls for a business depression—a real bust—in the early 1950's. Serious economists take little stock in it. But, with so many people buying the book, we may assume they are playing safe and putting their own houses in order, pending the big blow. Getting ready for a depression takes many forms. In general it involves freedom from debts that constitute a chain to the past. On the positive side it involves having some ready cash, either private or corporate, and a plan to spend it for a desired purpose when, as, and if bargain days come.

But if everybody is ready for a depression there may be a holiday—like our weekly business depression called Sunday—but there will be no distress. So Messrs. Dewey and Dakin could be wrong, as the economists believe, but yet do us a great service.

Water Facts Are Needed

PURE water in generous supply is one of the most vital raw materials of food processing. And the food processor stands very high in the competitive list of proper users when water supplies are limited. Perhaps the only group having priority over the food processor is the urban water-supply system needed for sanitary and household purposes.

Pure water can be had in adequate quantity only when natural sources are protected against both contamination and diversion to unwarranted use. The food industries generally are, therefore, deeply concerned with the proposed legislation, which has been pending in Congress for several years, for the prevention of stream pollution. It is important that food technologists inform themselves on this subject and express their needs and describe the importance of their business as affected by water supply.

Perhaps most important is the near prospect of Federal effort in fact gathering. If the Public Health Service could be put at that job, it would be possible before long to know what the sources

of contamination are, and how important they are in reducing suitable water supply on each stream. Proceeding from such facts, it will be possible for non-political and effective plans to be made by industry and states. All of this can be done without either wasteful spending by the federal government or injecting the element of political "pork" into the river-protection program.

These two dangers are very real because some of the federal folks would like to be put in charge of large public-works programs on various river systems so that they might enlarge their agency activities and have nice political plums to distribute in the form of patronage.

What the food industries need are facts. Neither federal aid nor a pork-barrel system can help at this stage. Perhaps we should tell our Congressmen these needed facts soon.

Tobacco Transmits Mosaic to Tomatoes

MOSAIC disease of tobacco can be transmitted to tomato plants from cigarette or pipe tobacco, according to a brief communication in the May issue of *The Home Garden*. The evidence presented appears to permit no other conclusions.

While setting out plants, the gardener had opened a fresh pack of pipe tobacco, filled his pipe, then set out additional plants. None of the first plants set out were afflicted, nor were the plants remaining at the source of supply. Only those that were set out after handling the fresh lot of tobacco developed the disease.

While it was emphasized that not every lot of tobacco or cigarettes is infected with mosaic virus, it seems that here is a potential hazard to tomato crops that needs recognition. And it may account for some crop failures that plague both grower and processor.

Government Research

UNCLE SAM spends more money on research than all other agencies in the United States put together. Taxpayers support a total of over $600,000,000 for such investigations annually. Even in the narrow field of food investigations it seems likely that the government spends more money than all of corresponding industrial enterprise combined.

For the smart food executive this indicates a need for closer watch on Washington activities and a greater alertness of staff to utilize promptly the results obtained. Certainly the real value of the research is realized only when the findings of the government workers are applied in practice.

Fortunately, substantially all of the government research bearing on food leads to published results available to everyone promptly. Thus the food technologist can expect to hear about important findings almost as soon as they are reached, that is if he does his part. This is in striking contrast with the situation in the field of military research where many of the findings must be kept secret for national defense purposes.

The part of the food technologist is to keep acquainted with both the publications and the personnel of the government who are working in fields most likely to be of direct value to his company. Visits to the government laboratories are desirable and welcomed. Conferences at convention time and correspondence on problems of common interest should be encouraged.

It is probably our own fault when our companies do not get their share of the benefit of the spending for which we as taxpayers pay.

Could Be

RUSSIA may be playing a game more foxy than we think. J. Stalin & Co. would like to extend their political philosophy to the entire world. If the private enterprise system in America continues to make profits for owners and workers the Commies have scant hope to gain control. But if all, or nearly all, business is abandoned by its owners to the government because the owners can't make any profits and are discouraged, would not this be the first step toward State Capitalism?

High taxes are one very effective means of taking all the economic joy out of life. Since the cost of a large Army and Navy is enormous, any nation that supports them must have high taxes.

Could it be that Uncle Joe, realizing the U.S.A. will never be an aggressor, continues to rattle the saber to compel us to tax ourselves for non-productive purposes, just to aid the cause of the fellow travelers?

Pay in Goods

FOREIGN nations are clamoring for food relief. Americans can spare some foods for this purpose. And we will. But there might well be certain conditions imposed.

America needs numerous imported food raw materials. Many of the nations which need help from us produce either at home or in controlled colonial areas some of the things we want. It seems reasonable that we ask for at least partial payment for our food aid. We can take that payment in the form of these needed imports.

Washington does not know enough to ask for all of the things that could well be requested. Interested food industries should, therefore, advise the government regarding our wants. It is not too much to hope that some of these may be satisfied in part as a result of the international relief arrangements now contemplated.

Those who wish to make an effort of this sort can well communicate with the State Department, the Department of Commerce, and the senators and representatives from their home states and home districts. This may increase a bit the chance of getting official consideration of such possibilities of barter, as the international program for relief and rehabilitation is developed during the coming months.

The Nash Clean-Air Compressor has but one simple moving part.

The Nash Clean-Air Compressor has but one moving part, cast in one piece and rotating in the pump casing without metallic contact. No internal lubrication is necessary; therefore air or other gas compressed with a Nash is entirely free from oil contamination.

Dust and heat are removed from the air, or gas compressed, by the unique Nash "Liquid Piston". Air from a Nash Compressor is therefore delivered free from dust, heat, or oil, without supplementary filters or air washers, in a perfected mechanical structure with no internal wearing parts.

Air or gas from a Nash Compressor may be used for agitating, blending, maintaining pressure on storage tanks, or moving liquids and materials by pressure displacement, in connection with the most delicate food, beverage, or chemical process, without danger of contamination.

Bulletin D-252 tells all about Nash Clean-Air Compressors, and it is free on request.

THE NASH ENGINEERING COMPANY

SOUTH NORWALK, CONNECTICUT, U. S. A.

NEW PACKAGES & PRODUCTS

Frozen Abalone Steaks Have Unique Wrap

TWIN abalone steaks are now being Cellophane wrapped and further protected by telescopic trays which permit easy consumer inspection.

Eye-catching and easily read, this new frozen abalone package was developed for Fisherman's Wharf Packers and Distributors, San Francisco, by Robert Carmack Associates, Richmond, Calif. The rigid shallow trays, 5x5x1 in., are "No-Glue" Painter style, printed in red on white patent waxed butterboard produced by Fleishhacker Paper Box Co., San Francisco.

The design is simple and distinctive. A white oval carries the word "abalone" against a dark background with a minimum of white printing on the front. Complete directions for frying abalone steaks appear on the back of the carton.

Lemonade the Easy Way

ANAGOLD, the brand name for products of Winckler & Smith Citrus Products Co., Anaheim, Calif., now appears on a tall can of Old Fashioned California Lemonade.

The can of lemonade contains 46 oz. No diluting is necessary. It needs only to be chilled. Contents include the usual lemonade ingredients—lemon juice, sugar and water.

Improved Product

ON the improved product list is Betty Crocker's new meat flavored Vegetable Noodle Soup Ingredients.

The product had no meat flavor. It now includes egg noodles, salt, dehydrated vegetables (onions, carrots, tomatoes, celery, bell peppers, parsley, spinach), vegetable protein derivative, meat extract, paprika, tumeric and flavorings.

The yellow and red package holds 2¼ oz., enough for 4 to 6 servings. Recipes for soup variations and meat loaf are on the back.

Cinnamon Takes to Melba Toast

ANOTHER time saver for the afternoon tea hostess is a product called Cinna-Mel, made by Devonsheer Melba Corp., West New York, N. J.

Melba toast is cut in inch and a half squares and rolled in a rich preparation of sugar and cinnamon. Twenty of the tidbits are packed in an aluminum foil wrap and placed in a colorful red folding carton. A yellow band across the face carries the product name and reproduction of the toast squares.

The manufacturer recommends Cinna-Mel for children's snacks and breakfast as well as for afternoon tea.

Net weight is 5 oz.

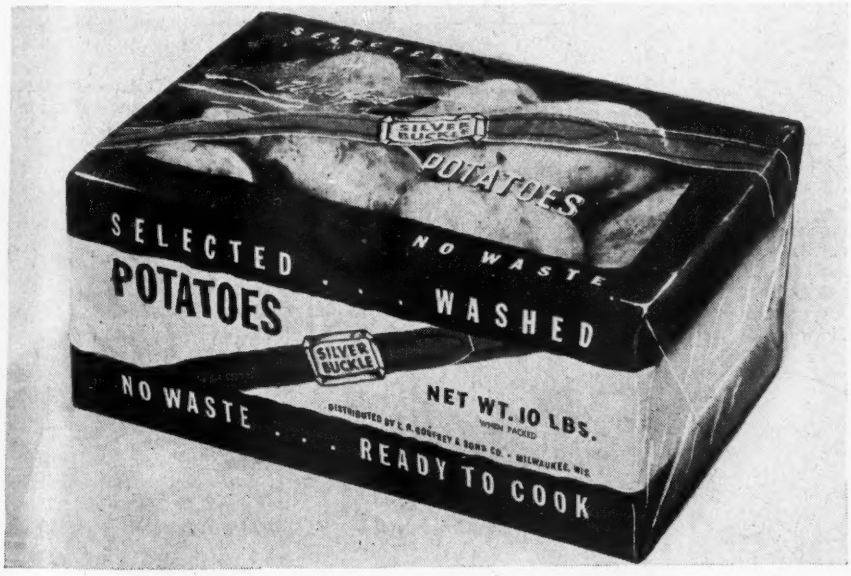
New Label Is Fused Onto the Bottle

THE famous map-of-Canada label that has appeared on Canada Dry's ginger ale bottles for twenty-five years has been replaced by an entirely new design with the imprint fused directly onto the glass or reproduced on specially treated paper.

Simplified for greater visibility, the new label shows only the name Canada Dry, in red on a white background map of Canada, within a shield emblem. Only on a small neck label do the words "ginger ale" appear as part of the slogan, "The champagne of ginger ales."

Paper labels, which tend to soak loose in the water bath type of beverage cooler, are being eliminated entirely in the five cent size bottle. The company will fill in with a transitional paper label bearing the new design until all the old bottles can be replaced.

Headquarters of Canada Dry Ginger Ale, Inc., are in New York.



Here Is a Package for 10 Pounds of Potatoes

AN attempt to glamorize the American potato has been made by E. R. Godfrey & Sons, Inc., Milwaukee, in designing its 10-lb. box for selected and washed spuds.

A corrugated box is overwrapped with colorful Cellophane produced by Milprint, Inc., Milwaukee. Bright blue borders are set off and contrasted with the cardinal red buckle strip which carries the "Silver Buckle" brand name. These colors are brought out through oil (rotary) reverse printing. The Cellophane is of 300 MSAT, making a moistureproof, heat sealable package that has exceptional sales appeal.

All the pertinent information is printed in extra large bold printing on the side of the wrapper. Net weight when packed is 10 lb.

Winner takes all

GOOD PACKAGING WINS

Paksure
FOOD PACKAGINGS

The winner is the package that is functional as well as eye-catching. It is a package adaptable to high speed production . . . one that is exactly suited to its job. Twitchell can help find the answer . . . from experience or special experiments. A complete line of boxes, wrappings, bags, envelopes and in cardboard, glassine, cellophane, pliofilm, laminated papers, etc. for dry or frozen foods. Stock or original packages designed. Send your packaging problems to us today.

Prompt Delivery

Literature and prices on request.

PACKAGING DIVISION
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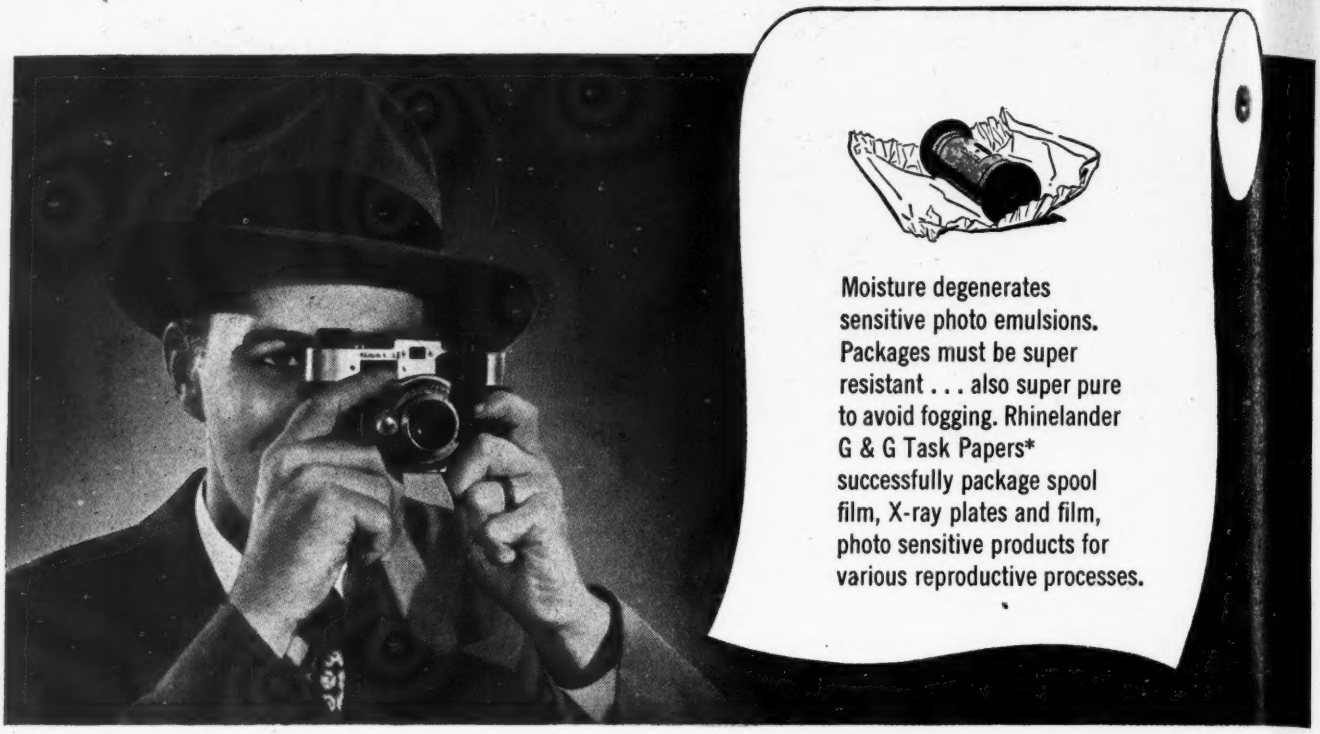
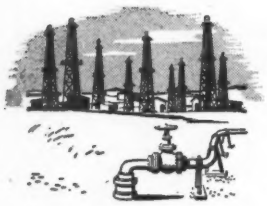
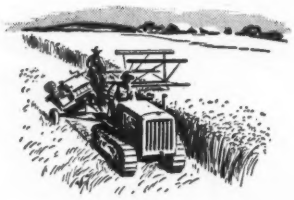
Paper with its Sleeves Rolled Up···Hard at Work



Moisture degenerates sensitive photo emulsions. Packages must be super resistant . . . also super pure to avoid fogging. Rhinelander G & G Task Papers* successfully package spool film, X-ray plates and film, photo sensitive products for various reproductive processes.

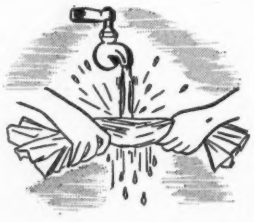


Rhinelander Salutes the Petroleum Industry whose advances have contributed vastly to protective packaging. New paraffines, micro-crystalline waxes, aromatic solvents, plasticizers now make possible the miracles of laminated and lacquered Rhinelander G & G Task Papers.*



The Pop, Snap, Crackle with which the ads symbolize the crisp goodness of American breakfast food are qualities that perish with exposure to moisture. Rhinelander G & G Task Papers* bring you pristine fresh these good products of U. S. grain fields.

A Planter of Sao Paulo puts his heart and brain into growing coffee of which he is justly proud. Rhinelander G & G Task Papers* deliver it to your kitchen with delicate aromatic oils retained . . . flavor sealed *in* . . . contamination *out*.



Rhinelander Has Done It!—added WET STRENGTH to the already remarkable properties of G & G Task Papers.* Excited packaging experts are busy putting to work these new papers that remain strong even when soaking wet.

Soup's On!—and in five minutes because our modern food industry has concentrated the elements of fine soup in a paper package. Rhinelander papers retain elusive chicken fats, protect dehydrated vegetables and sensitive seasonings in these artful work savers.

Glassine and Greaseproof—the functional papers that do so many tough jobs well.

IN THE LAND O'LAKES • MILLS AT RHINELANDER, WISCONSIN

Hard Working
PROTECTION

HODGMAN APRONS
for Safety and Efficiency
in the Food Industries

No. 7100

Combining maximum protection with hard-wearing quality and free action comfort, Hodgman Industrial Aprons have been found particularly adaptable to industries in the food field.

No. 7075 (above) is a rugged, serviceable white apron widely used in the dairy, canning and packing industries.

No. 7100 is a strong black apron resistant to dilute acids and abrasion. The No. 7100 apron is used especially for acid protection.

No. 7130 is a white apron made especially for use in canning products with liquid content. Made of sheeting and coated with general purpose rubber on both sides, it withstands much abuse and affords long service.

No. 7130

Send for complete details regarding Hodgman Aprons for industrial use.

HODGMAN
Rubber Company
FRAMINGHAM, MASS.

New Formula—New Wrap

KRAFT FOODS CO., Chicago, has changed the formula of its Frizz Ice Cream Mix and put it in a striking new package.

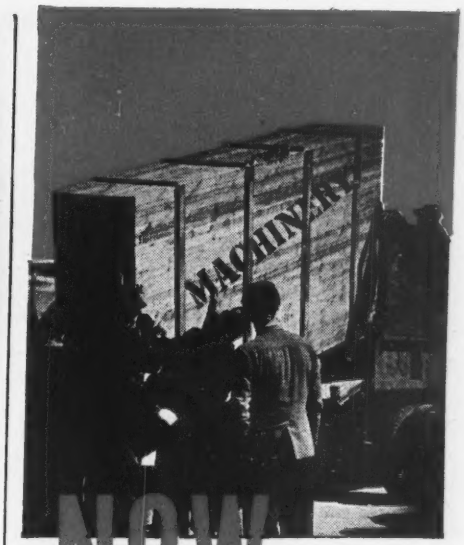
Biggest change is in the addition of sugar to the mix so that only water has to be added to make the ice cream. The basic product is a dried blend of cream, milk, sugar, corn sirup solids, vegetable gums, dextrose, di-sodium phosphate, artificial vanilla flavor and U. S. certified color.

The package is French blue with modern yellow and white lettering, the word Frizz being outstanding. Comprehensive instructions for preparation appear on the back. The mix is protected by a heat sealed glassine envelope. Net weight is 5 oz.

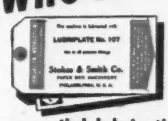
Oyster Stuffing

A CANNED ready-to-use oyster stuffing has been placed on the market by Espy of Oysterville, Inc., Oysterville, Wash.

Packed in a 14-oz. tin, the stuffing offers the housewife a prepared dressing with nothing to add and nothing to mix. The stuffing may



NOW
WHO'LL LUBRICATE IT?



The LUBRIPLATE Tag Service assures the machinery manufacturer, who uses LUBRIPLATE for initial lubrication, that the machines will be serviced with the same outstanding lubricant. Machine Builders, use the Tag Plan. Machine users, mail the post cards you find on the equipment.

℞ FOR YOUR MACHINERY

No. 2 — Ideal for general oil type lubrication, ring oiled bearings, wick feeds, sight feeds and bottle oilers.

No. 8 — Because of high film strength and long life it reflects outstanding performance in most types of enclosed gears (speed reducers).

No. 107 — One of the most popular grease type products for general application by pressure gun or cups.

No. 70 — For a wide range of grease applications, especially at temperatures above 200 degrees F.

No. 130-AA — Known nationwide as the superior lubricant for open gears, heavy duty bearings, wire rope, etc.

BALL BEARING — This is the LUBRIPLATE Lubricant that has achieved wide acclaim for use in the general run of ball and roller bearings operating at speeds to 5000 RPM and temperatures up to 300 degrees F.

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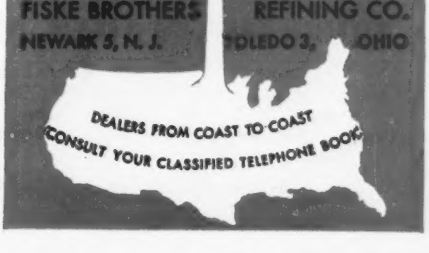
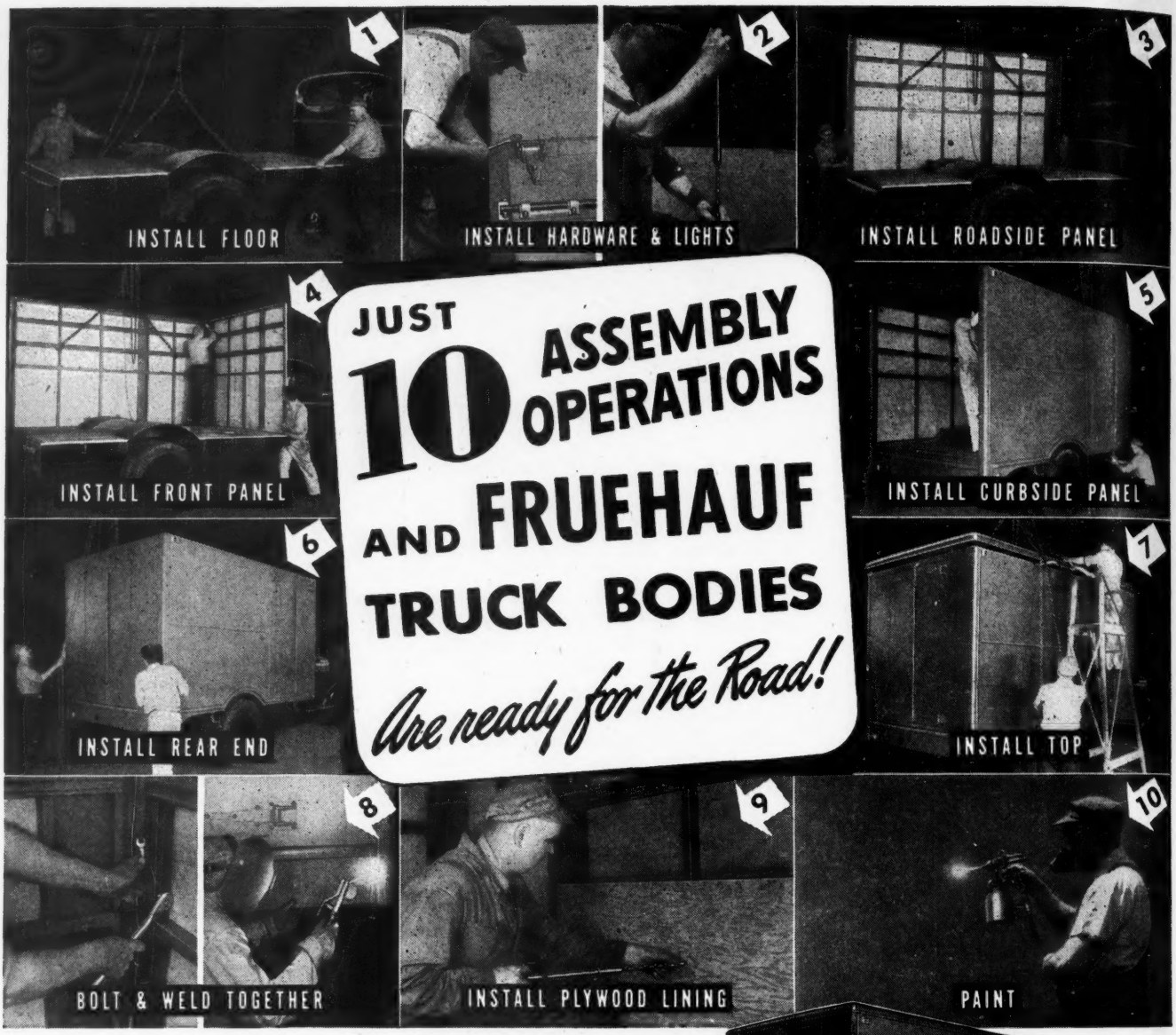
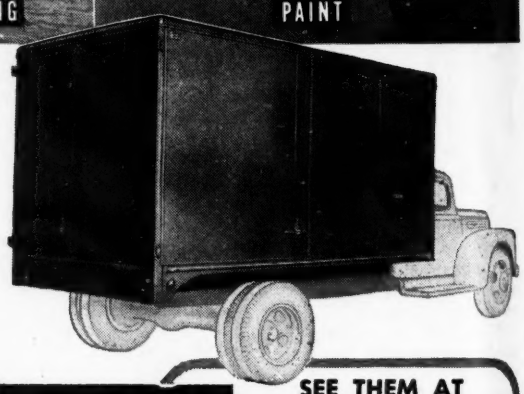




● This picture sequence shows the ease of assembly and why Fruehauf All-Steel Truck Bodies are ready for the road in merely a matter of a few hours. Any Fruehauf Factory Branch can assemble one as you want it and install it on your truck chassis — or you can do it. The body combinations are practically limitless — more than 500. And, production-line manufacturing makes possible remarkably low prices.



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70 Factory Service Branches

Famous "AEROVAN" construction. Maximum strength—with minimum weight.

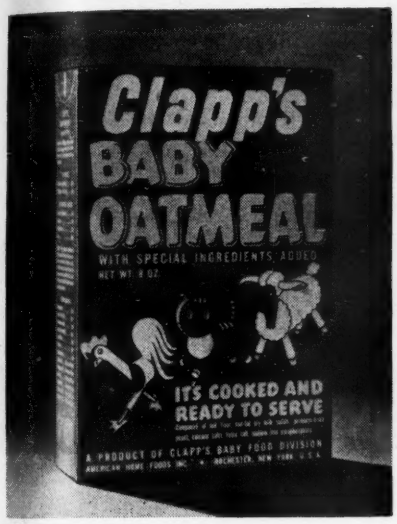
4 Basic Models ... Hundreds of Combinations!

FRUEHAUF TRUCK BODIES

be emptied into a bowl, fluffed with a fork and packed into turkey, fish or various cuts of meat.

This stuffing contains such flavorsome items as oyster slices, bread crumbs, salt, butter, nutmeats, ham and bacon fat, suet, sage, onions, curry and pepper.

Rolled into balls and fried in deep fat, the stuffing makes cocktail tidbits. It also may be used as a casserole by adding lemon juice and bacon strips and baking in a hot oven.



Cartoons on Cartons

As the result of pre-consumer tests, a new wrapper that features sketches of nursery animals has been selected for Clapp's Baby Cereal and Clapp's Oatmeal packages.

Designed for American Home Foods, Inc., by Georges Wilmet, the three color wrappers display seven different animals, cartoon style, romping around the carton.

The baby oatmeal wrapper is yellow and blue on a maroon background; the baby cereal wrapper is maroon and blue on a yellow background.

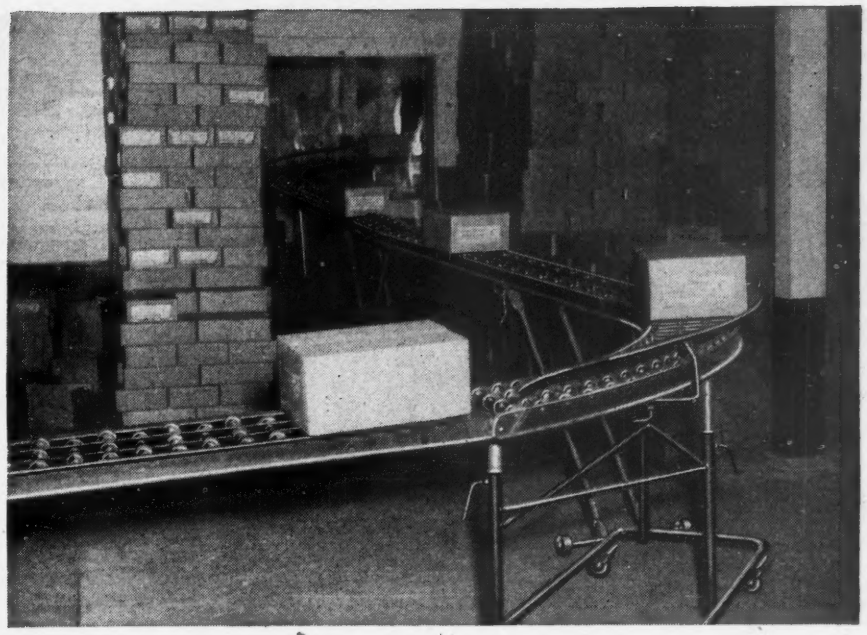
Important information is in very large print, as are the brand and product names.

Distribution of packages with the new wrapper is already under way.

Aluminum Cracker Wrap

FOR its extra thin crackers, Wortz Biscuit Company, Fort Smith, Ark., is using an attractive overwrap of aluminum foil printed and fabricated by Milprint, Inc., Milwaukee.

The foil is a .00035 glue-mounted to 18 pound sulphate. The material is thermoplastic coated on two sides for heat sealing.

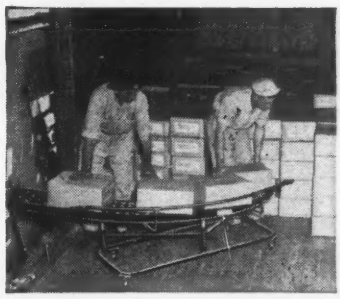


Cut Labor Costs

WITH

RAPIDS-STANDARD

CONVEYORS



Fast, efficient handling of the cases and empty jars from the time they enter the plant, throughout filling, storage and loading is accomplished at Cinderella Foods, Inc., Dawson, Ga., through the use of a Rapids-Standard Conveyor System.

In the words of Mr. C. M. Cruikshank, Executive Vice-President: "The savings in labor for us is tremendous. I estimate that your gravity track and boosters are saving us from $200 to $250 each week. We just couldn't do without them and if no more were available, we wouldn't sell them for five times what they cost."

The Rapid-Wheel Gravity Conveyor and The Stevedore, Jr. (Power Belt) Booster make a handling team in this plant that eliminates all strenuous lifting and hand moving. Cartons placed on the conveyor at the loading dock move on to their destination without rehandling. Stevedore, Jr. does the heavy lifting work and Rapid-Wheel Conveyor carries the cases through the plant by cost-free gravity. Cases move in a minimum of space all the way and traffic problems are non-existent. Both Stevedore, Jr. and Rapid-Wheel Conveyors are easily portable and can be quickly set up in any part of the plant or warehouse.

Check into the advantages of this cost reducing equipment today. What it has done for hundreds of others it can also do for you. It COSTS NOTHING TO GET FULL PARTICULARS. WRITE TODAY FOR FREE LITERATURE.

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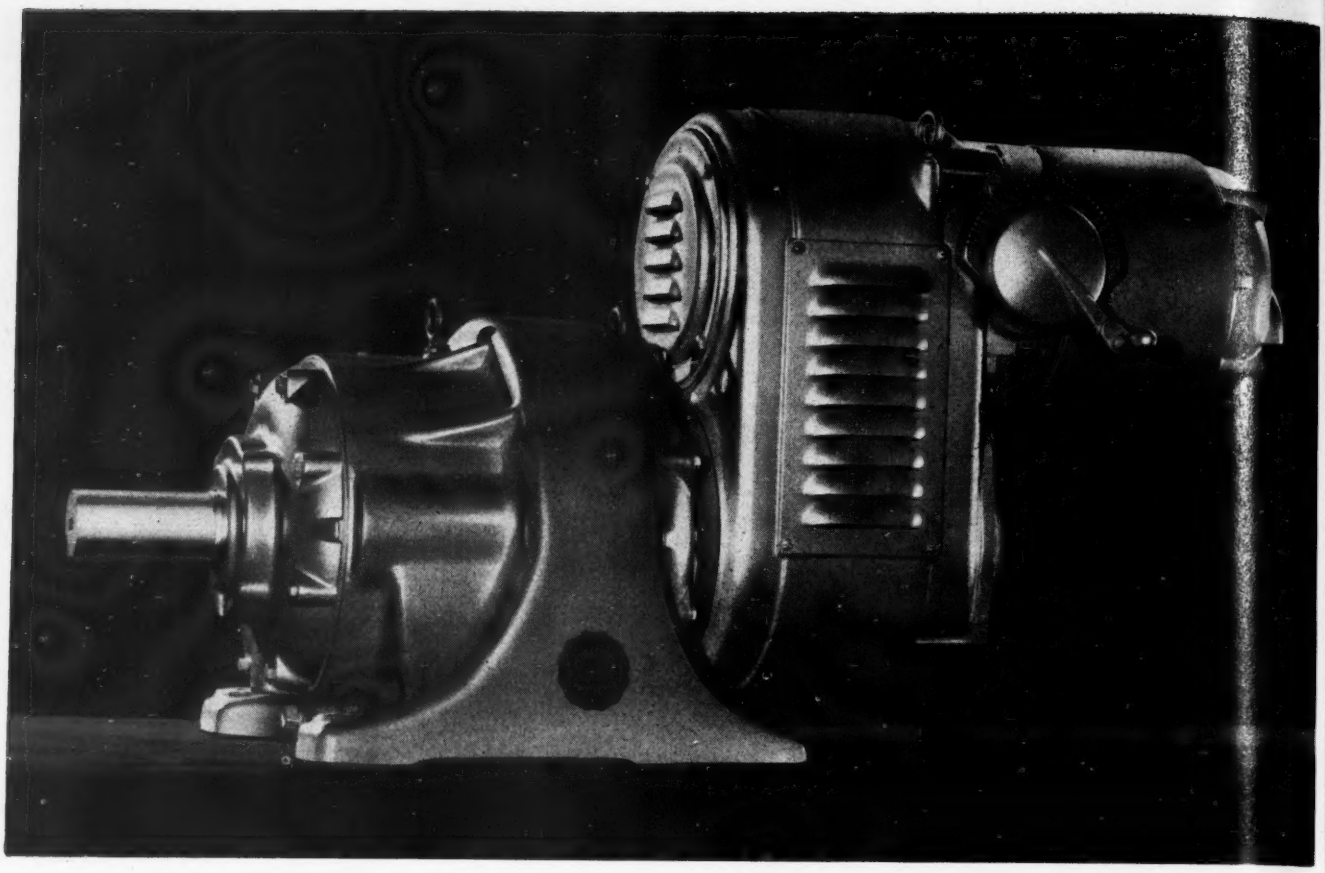
Manufacturers of

STEEL FORGED CASTERS · TRUCKS · CONVEYORS · POWER BOOSTERS

The Rapids-Standard Co., Inc.

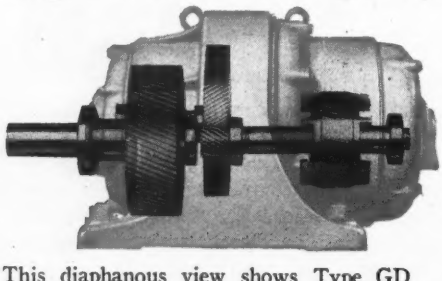
Sales Division—361 Peoples National Bank Bldg., Grand Rapids 2, Mich.



Type VEV-GD—Double Reduction Combination Varidrive-Syncrogear

THE GEARED MOTOR WITH PYRAMIDAL STABILITY

Structural rigidity is of primary importance in a geared electric motor. The *U. S. Syncrogear* motor consists of a heavy, one-piece pyramidal base casing, within which is mounted the gear trains. Model VEV-GD, illustrated above, shows the Syncrogear in combination with a U. S. Varidrive motor, to obtain very low but *variable* speeds. You can also obtain the Syncrogear with constant speed motors. In the Syncrogear, electrical design is coordinated to give optimum overall performance. The unit is most compact, occupying little more space than an ordinary motor. It incorporates the basic U. S. Motor features including asbestos protection, normalized castings, solid cast aluminum rotor and Lubriflush lubrication. For ever-dependable geared power, install the *U. S. Syncrogear.*



This diaphanous view shows Type GD Double Reduction U. S. Syncrogear. Note its compactness. Various types of Syncrogears are available, to meet any requirement for geared electric power.

U. S. SYNCROGEAR MOTOR

offers these desirable features:

1. *Rugged pyramidal base.*
2. *Gears hardened to 45/50 Rockwell C.*
3. *Quiet, long-life operation.*
4. *Precision-finished helical gear train.*
5. *Gears held in permanent alignment.*
6. *Fully-enclosed, easily cleanable.*
7. *Anti-friction, high-efficiency bearings.*
8. *No rubbing seals to cause leakage.*
9. *Solid integral shank pinion.*
10. *Effective gear-dip lubrication.*

Double, single and triple reductions are available, in sizes of ¼ to 30 h.p. and standard AGMA speeds of 10 rpm. to 10,000 rpm.

New illustrated engineering Bulletin upon request.

U.S. ELECTRICAL MOTORS Inc.

Atlantic Plant: Milford, Connecticut

Pacific Plant: Los Angeles 54, California

District Offices: Boston 16—New York City 6—Philadelphia 2—Pittsburgh 22—Chicago 8—San Francisco 7—Seattle 4

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FOOD INDUSTRY NEWS

GENERAL

Food and Container Associates Plan to Develop Food Research

Dedication meeting attracts food industry executives and technologists to government sponsored organization

AFTER a five-month organizing effort, the Associates of the Food and Container Institute for the Armed Forces held a dedication meeting at the Hotel Statler, Washington, November 6.

AFCI is designed to occupy the twilight zone between a strictly independent trade association, such as the Grocery Manufacturers Association, and a professional society like the Institute of Food Technologists. Linked with the Quartermaster Corps' Food and Container Institute, AFCI is a nonprofit organization designed to "promote joint effort in fundamental food and container research and to disseminate to industry the information this research produces." It will also serve as a clearing house for research activities, personnel and facilities. The development and maintenance of a research mobilization plan, to cope with a national emergency, will also be a part of the organization's function.

Speakers at the dinner culminating the day's meeting stressed the peacetime value of research on problems of foods and containers to both the armed forces and to the nation as a whole. Thomas E. Wilson, chairman, Wilson & Co., recounted the tremendous progress in the handling of meats that resulted from cooperative research between industry and the Army and Navy during the war.

Stressing the three-way tieup—government, private industry and educational institutions—Franklyn B. Snyder, president of Northwestern University, considered it important timing that the Associates should be formed at this time. "It is not beyond the realm of possibility," he said, "that science, encouraging as it does the free play of the intellect, might find the antitoxin for the cancer of communism."

Clarence Francis, chairman, General Foods, pointed to the value of "showing the rest of the world how to produce—not industrially but agriculturally." We have manpower, goods, wealth and food to spare, he continued, because of our success in research and the application of research. "It is our task," Mr. Francis concluded, "through research, not merely to find but to lead the way to peace."

During the day an exhibition of specialized foods and services by 14 organizations cooperating with the institute was open to the public. The organizations were: H. J. Heinz, National Biscuit Co., Pillsbury Mills, General Foods, Kraft Foods, Borden Co., Cambridge Tile, National Confectioners Association, National Livestock & Meat Board, Brewers Yeast Council, Marathon Corp., Basic Vegetable Products Co., Hershey Chocolate Co., Fiber Drum Manufacturers Association, and the American Dry Milk Institute.

Hopkinson and Babson Head Atlantic Coast

ATLANTIC COAST FISHERIES, last month elected Lawrence T. Hopkinson president of the company to succeed Edward H. Cooley. Before his election, Mr. Hopkinson was vice-president and general sales manager of this well known east coast company.

At the same time, Roger W. Babson, noted economist, succeeds F. Meredith Blagden of New York, as chairman of the board. Walter Engel continues as secretary and treasurer.

Mr. Hopkinson has been identified almost exclusively with the seafood and allied industries for the past 20 years. He is a vice-president of the National Packing Corp., and the Aquacide Co., both of which have headquarters in Boston.

At the beginning of the war, he headed the Fisheries Division of the War Production Board and the Fish Industry Advisory Committee of the War Food Administration. Later, he served as vice-president of the Federal Surplus Commodities Corp., executive officer of the Combined Food Board, vice-chairman of the Food Requirements and Allocations Committee, and chief of Requirements and Allocations Control. Recently, he was elected to membership on the international trade committee of the National Canners Association.

Wide World

FEED PELLET MACHINE

The tall unit on the right is a completed mill for converting animal feed into pellets. The other three structures are the receiving assemblies, each of which forms the upper portion of a mill, into which hay, alfalfa, fiber and powdered mash are poured. The ring on floor is an extrusion die containing 8,000 holes.

QUARTERLY REPORTS SHOW FOOD EARNINGS

FISCAL quarter earnings showed a decline over the corresponding period last year for two food companies, while a third company registered a notable profit, in financial reports recently issued.

Beatrice Foods Co. showed a net profit of $1,014,901.66 for the three months ending August 31. This compares with $1,870,205.98 for the same quarter in 1946. General Foods Corp. dropped to net earnings of $4,249,337, or 76 cents per common share, for the quarter ending September 30. The corporation's net profit for the same 1946 period was $4,683,529, or 84 cents per common share. Net sales for the quarter were $106,777,433, compared with $76,491,113 for the 1946 quarter. Allowance of $213,918 was made for third quarter dividends on preferred stock, payable from the July 3 issuance date to September 30. There was no preferred stock last year.

Best Foods, Inc., reports a consolidated net profit of $2,531,553 for the quarter ending September 30, which compares with $1,105,667 for the same period last year. Profit per share rose to $1.69 from 74 cents in 1946.

Continental Can Co. rose from a year's profit of $4,730,233 for the twelve months ending Sept. 30, 1946, to $10,285,846 for the year ending September 30. This was equivalent to $1.65 and $3.26 per share, respectively.

Ample Raw Materials Bolster Pickle Packers

WITH an adequate supply of raw material on hand to meet an increasing demand for pickles while avoiding a price-depressing surplus, the National Pickle Packers Association was in an optimistic mood as it celebrated its 55th anniversary at Chicago in October.

Edward T. Miller, secretary of the association, reported a 1947 intake of 4,923,962 bu. from 45.82 percent of the 1946 contracted acreage. This is equivalent to a projected intake of 10,746,316 bu. for the entire country. This intake with an Oct. 1 carryover of 1,967,306 bu. old crop brine stock gives a projected inventory of 11,438,698 bu. total brine stock as compared with 9,890,662 bu. on hand Oct. 1, 1946.

Viewed superficially, this inventory increase of approximately 1,500,000 bu. appeared to be surplus in view of the nearly 2,000,000 bu. carryover from the 1946 crop. However, a study of consumption trends shows a 952,495 bu. increase between Oct. 1, 1946, and Sept. 30, 1947, over the previous 12 months; 9,198,280 bu. as compared with 8,245,785 bu. between Oct. 1, 1945, and Sept. 30, 1946, approximately 7,500,000 average during the war years 1941-45, 6,000,000 bu. average during 1936-41, and 4,500,000 bu. average during 1930-35. Present indications are for a continuation of the accelerated consumption to balance, at least, the increase in 1947 production over 1946 and the increased inventory on hand Oct. 1, 1947.

Research Projects

Olney Brown, chairman of the research committee, reviewed the research projects of last year and recommended allocation of an additional $5,000 for strictly scientific research. Projects are being carried on at North Carolina State College and Michigan State College. The Buhler Co. reported progress on the machine for electronic sorting of pickles. Findings are to be reported in full at the January 17, 1948, meeting in New York City.

Studies going on at North Carolina State College and Michigan State College include research on spot rot affecting the quality of cucumbers and on the development of cucumber seeds. Dr. F. W. Fabian at Michigan State College is analyzing samples of various varieties of pickles picked up in retail markets and sent in by members of the association. The analysis includes chemical, physical aspects, as well as color, flavor and sanitation.

Harry Conley, Green Bay Food Co., Green Bay, Wis., was elected president, Leon S. Glaser, Glaser Crandell Co., Chicago, vice-president, and E. G. Price, Libby, McNeill & Libby, Chicago, treasurer.

School of Nutrition Dedicated at Cornell

THE first known college building to be erected by farmers was dedicated in October, when Cornell University celebrated the completion of a new home for its school of nutrition. In a unique three-way partnership, the farmers of northeastern New York State financed the building, the State furnished laboratory and office equipment and the university provided the site and the instructional and research staff. As Savage Hall, the building honors the memory of Prof. Elmer Seth Savage, an early leader in nutrition studies at Cornell.

The $500,000, four story structure was dedicated in the presence of leaders in the field of nutrition, the food industry and government. The gathering heard addresses by New York Governor Thomas E. Dewey, W. H. Sebrell, National Institute of Health, and Rep. Clifford R. Hope, chairman of the House committee on agriculture. Presenta-

"I HAPPEN TO KNOW THEY'RE BREWING THEIR MORNING COFFEE!"

tion of the building was made by Frank M. Smith, chairman of the New York State Conference Board of Farm Organizations. The dedication was made by the school's director, Dr. Leonard A. Maynard.

Co-ops Growing Fast, BLS Report Reveals

FOR the year 1946, the cooperative movement in the U. S. rolled up a record that includes some interesting statistics.

Local cooperatives did a retail and service business of more than $800,000,000.

Wholesale associations to which the retail co-ops belong also had a record-breaking year, with sales and services of more than $220,000,000. Net earnings were up to $11,500,000, of which $8,250,000 was returned to member associations on their patronage.

Co-op-owned production facilities (where earnings have proved to be greater than in distribution) now manufacture canned goods, bakery goods and meat products—besides such non-food lines as petroleum and its products, paint, lumber, chemical products, feed, seed, fertilizer, and farm machinery. Co-op production in 1946 was valued at over $95,000,000, compared with only $14,000,000 in 1941.

Bakers Hear Plans For Present and Future

UNDER the slogan of "50 years . . . Forward," the American Bakers Association outlined its recommendations for the national food conservation program at its golden anniversary convention in Chicago, last month.

Among the recommendations offered were the use of greater quantities of non-critical ingredients such as fruits and sugar; substitutes for wheat flour in dusting; reduction of varieties, and featuring of smaller loaves where more than one size is available.

The association's long range plans were stressed in both the general meetings and in the divisional sessions, in keeping with the slogan under which the program had been formulated.

All officers were reelected. They are: Harry W. Zinsmaster, Duluth, Minn., chairman; C. P. Binner, Chicago, president; E. K. Quigg, Richmond, Va., 1st vice-president; H. W. Kilpatrick, San Francisco, 2nd vice-president; M. E. Marshall, New York, treasurer, and Tom Smith, Chicago, secretary.

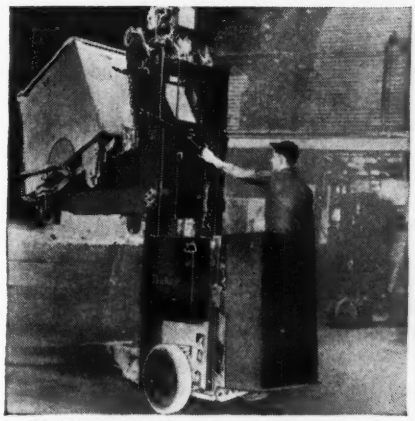
Even if you now use Industrial Trucks you may still cut handling costs!

Here's how one BAKER TRUCK customer did it:

In many plants Material Handling—like Topsy—just grew. Equipment for mechanizing individual handling operations was acquired piece-by-piece as needed. Although time and cost advantages were gained in each case, a lack of integration between departments usually prevented full realization of all the benefits possible.

Take the case of the Hammermill Paper Company in Erie, Pa. Their problem involved handling in process, storing, routing and loading an annual production well over 100,000,000 lbs. of some 3,000 kinds, sizes and colors of paper. Each department had its own electric trucks—and controlled its own handling operations.

Two years ago, after extensive study by its engineers, the company incorporated all trucks and handling personnel under one department, headed by a qualified expert who administered



Substantial savings were made by using a Baker Hy-Lift Truck with special tilt-type platform for charging beaters with pulp.

details and expedited the material handling program. Immediate benefits were:

1. Full utilization of trucks and personnel
2. More material handled with same equipment
3. Better maintenance of equipment
4. Improved transportation service in operating departments
5. Reduction in material handling costs

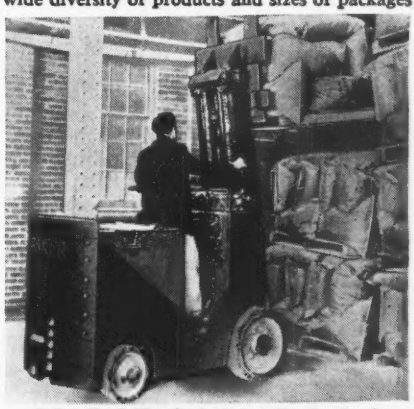
A survey, after the new program had functioned for six months, showed that centralized, as against departmental control, resulted in the utilization of existing trucks to the best advantage in receiving, production, warehousing and shipping departments—providing maximum service at minimum cost.

The program had also resulted in the adoption of the pallet-fork truck method for handling raw, in-process and finished product. Materials such as clay, starch and talc are received in bags. Substantial savings were made by palletizing these bags on arrival and transporting unit loads by fork truck to storage and to production. Still further savings will come when all suppliers can be persuaded to ship material on pallets—negotiations for which are under way. It now takes about 14 hours to palletize a car of 1600 bags—weighing about 50 lbs.—but when material arrives already palletized unloading and warehousing can be completed in about 2 hours per car.

Palletizing also resulted in cutting unloading time of knocked-down shipping cartons from 24 hours per car, when they arrived loose, to approximately 3 hours, since they arrive in unit loads strapped to pallets, permitting fork-truck handling.

Additional benefits from centralized control of handling were reported when another survey was made at the end of 1946. Departmental superintendents, freed of material handling problems could now concentrate on production. Plant safety had been improved. Extension of mechanized handling eliminated much heavy manual labor—making these men available for higher paid, productive work. Work flow has been made more efficient and direct. With all handling under one control, proper allotment assures adequate equipment for all departments. Maintenance costs on trucks were lowered. The pallet-fork truck method, besides saving as mentioned, effectively solved the problem of handling a wide diversity of products and sizes of packages

Baker Fork Truck picking up unit load of lap pulp for loading into box-car for shipment.



Baker Fork Truck tiering pallet loads of bagged starch in storage. Note method of "locking" sacks to prevent side-slipping.

—incoming materials and out-going products. A new warehouse, just completed, was designed around mechanized handling of unit loads. Tractor-trailer trains are assisted by fork trucks—permitting efficient, orderly storage, full utilization of space by tiering, and speeding order assembly for shipment.

Centralization of handling operations can be applied in large or small plants. If you want maximum benefits from your modern handling equipment, a Baker Material Handling Engineer can help you set up a central control in your plant.

See us at Booth 303
Materials Handling Exposition
Cleveland, January 12-16.

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Baker INDUSTRIAL TRUCKS

Agriculturists Confer On Radioactive Uses

A NATION-WIDE conference on the use of radioactive isotopes in agricultural research is to be held December 18 to 20 at Alabama Polytechnic Institute, Auburn, in cooperation with the Oak Ridge Institute of Nuclear Studies.

The three-day meeting, which will include lectures by some of the country's foremost investigators in the field, will be the first to be held in the world on the application of radioactive materials to agricultural research. Some 300 scientists from all sections of the United States are expected to attend.

One section of the program will be devoted to the use of radioactive materials in nutrition and animal husbandry research. Lecturers in these fields include Dr. G. Harold Copp, radiation laboratory, University of California School of Medicine, Berkeley; Dr. Howard B. Skipper, Southern Research Institute, Birmingham, Ala.; and Dr. J. G. Davis, animal husbandry department, University of Florida, Gainesville.

The first day of the conference will be concerned with fundamentals, while the second day will be devoted to use of radioactive materials in the research fields of plant physiology, soils, and horticulture and to laboratory demonstrations of typical tracer experiments.

Room and meal accommodations on the Alabama Polytechnic Institute campus have been arranged for the conferees.

Swift & Co. Patents Opened for Licensing

SWIFT AND CO. and its subsidiaries have placed 433 patents on the Register of Patents Available for Licensing of the Patent Office, U. S. Department of Commerce. By this action, Swift and Co. publicly announces that these patents are available for licensing by other firms and individuals on terms to be agreed upon.

These patents fall within 12 broad classes and were developed by the corporation in connection with processing, distribution and sales of meats, meat products and related commodities. Sixteen of them cover butchering and slaughtering; 44 pertain to fats and oils; 47 to beef, lamb and veal; 103 to ham, bacon and fresh pork; 66 to dairy products and poultry; 29 to sausage and table-ready meats; 29 to gelatine, glue and adhesives; 28 to casings; 29 to soap, glycerin and cleansers; 24 to miscellaneous commodities, and 7 to refrigerator cars and motor vehicles. Twenty-one of them relate to plant food, more commonly known as fertilizers.

Descriptions of some of the patents as filed with the Patent Office indicate that they are adaptable for use in industries not directly connected with the processing of foods. Inquiries concerning these patents should be addressed to Swift and Co., Union Stock Yards, Chicago, Ill.

About 18,000 patents have been listed by firms and individuals since the Register was established in May, 1945, to provide a medium of contact between patent owners and firms seeking new devices and products to manufacture. It was initiated to expedite utilization of new inventions and to aid employment. The Radio Corp. of America, United Shoe Machinery Corp., International Harvester Co., Owens Corning Fiberglas Corp., and the Petrolite Corp. are among the firms which have previously placed large blocks of patents on the Register.

QMC Class Completes Subsistence Course

THE third regular class of the Quartermaster Subsistence School, Quartermaster Food and Container Institute, Chicago, were graduated in October. Twenty-seven officers were in the six-month course of study covering all phases of military subsistence. Courses included procurement of subsistence items, grading, storage, nutrition, issue and preparation. More than sixty industrial organizations furnished cooperative assistance in making the course very thorough, providing facilities for field trips, training aids and guest lectures.

Brigadier General Merritt Curtis, Chief of the Disbursing Branch, Supply Department, U. S. Marine Corps, addressed the graduating class.

Agriculture Research Projects Announced

A CONSIDERABLE number of authorized research projects, for other than fruits and vegetables, have been announced by Mr. E. A. Meyer, Administrator of Research and Marketing Act of 1946. The following summary, giving highlights of some of these projects, continues the series reported in previous issues.

Farm mechanization and its effect on the production of cotton, sugar, rice, and dairy farming is to be studied jointly by the Bureau of Agricultural Economics, the Agricultural Research Administration, and State Experiment Stations where the commodities involved are important. Lower production costs are anticipated, with resulting improvement in the competitive position of the specific crops investigated.

Better marketing facilities are hoped to lower the cost of handling foods and farm commodities within city limits. Assembly markets for grading, packing, and display are often unsatisfactory or non-existent. Labor-saving devices are also lacking in many marketing establishments. This project is designed to determine what kinds of market facilities will make possible the most efficient handling of farm food products at terminal, concentration points and secondary markets. The Production and Marketing Administration will have the principal responsibility for carrying out this project, cooperating with various organizations in normal marketing channels.

Honeybee products would be developed by a project assigned to the Bureau of Entomology, in cooperation with interested medical institutions. Valuable anti-biotic agents may result from research in this field, according to the Department announcement.

Better farm data sampling will

Wide World

NEW KANSAS CITY BAKERY

Judging from this model, Sunshine Biscuits is going all-out in the construction of its new bakery for the Kansas City area. It will have over 2,000 windows.

be studied by the Bureau of Agricultural Economics with cooperation in the Western States. It is hoped that more accurate data can be collected through improved sample methods which should result from these studies.

Stability of soybean oil flavor will be the subject of intensified study directed by the Northern Regional Lab at Peoria and coordinated with related work by the States and by private industry. New fundamental research will be carried out to detect, isolate, and identify the constituents of soybean oil that are now responsible for objectionable flavors. The Soybean Advisory Committee recommended that improved flavor stability of soybean oil is "by far the most urgent problem" facing the industry's research workers.

Peanut Uses

Improved quality of peanut products and new uses for them are the goals of a project to be directed by the Southern Regional Lab at New Orleans, in cooperation with other agencies. Improved peanut butter is one of the principal aims. Use of peanut oil in salad dressings is to be another phase of this project, with pilot plant studies contemplated.

Merchandising and distributing methods for canned and frozen fruits and vegetables, as practised by cooperatives, will be studied in a project under the supervision of the Farm Credit Administration. Actual case studies will be made at about 50 cooperative plants. "The findings are expected to be applicable, however, to all types of processors."

Better methods for malting barley is the goal of a research project to be carried out under the supervision of Bureau of Plant Industry in cooperation with the State Experiment Stations in barley-growing areas and with other groups. A new research laboratory with pilot plant facilities is to be built on the University of Wisconsin campus at Madison, equipped to serve all barley-producing areas and the malting industry for the entire country.

Market news services will be improved by a case study of the various services as they now operate. This project is to be supervised by the Production and Marketing Administration with the cooperation of Bureau of Agricultural Economics.

Storage of sugar beets and cane to maintain the sugar content and quality will be studied by Bureau

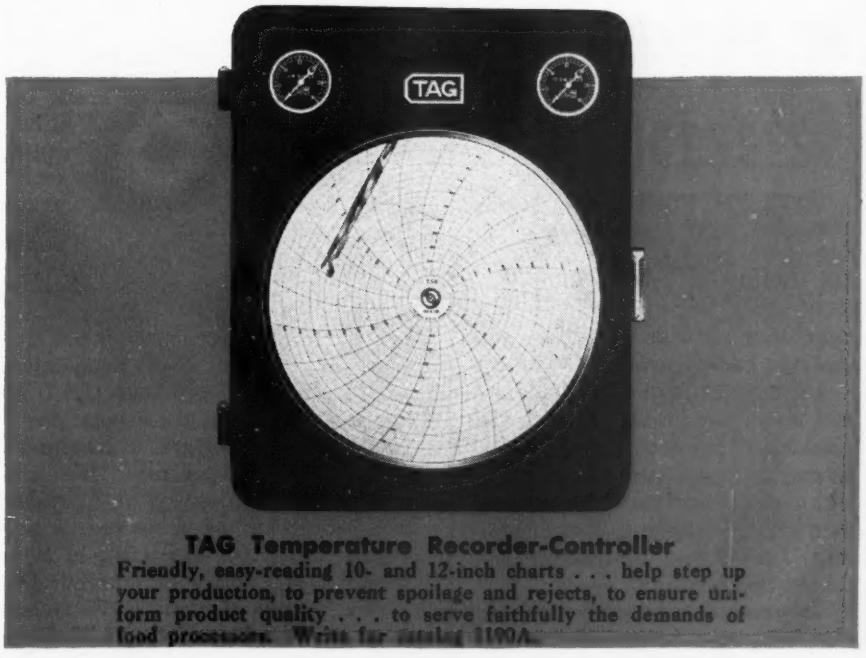
DEPENDABILITY is important

"The mail must go through"—trite, but a fact nevertheless. The U. S. Postal System, through good times and bad, has built up an enviable reputation for unfailing service, *You can depend on the U. S. Mail!*

You Can Depend on

TAG Instruments

Instrument men in every process industry have learned to "trust TAG". From fundamentals to fine points . . . correct design and rigid manufacturing standards combine to produce TAG instruments which are unbeatable for dependability. TAG manufactures all types of temperature and pressure indicators, recorders and controllers. Call your district TAG representative.



TAG Temperature Recorder-Controller
Friendly, easy-reading 10- and 12-inch charts . . . help step up your production, to prevent spoilage and rejects, to ensure uniform product quality . . . to serve faithfully the demands of food processors. Write for catalog 1190A.

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In-Plant Chlorination

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Yes, WASH WATER and other food process water sterilized by IN-PLANT Break-Point Chlorination does a "Saturday night" job every day — reduces production losses and off-flavors — and speeds clean-up. For details of this field proven money-saving quality insurance, write to:

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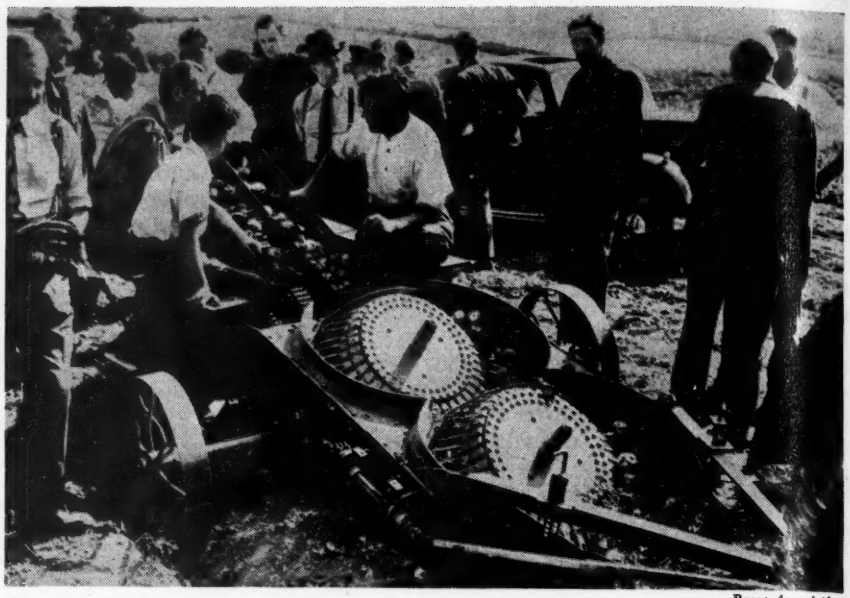
PACKAGING IS NO PROBLEM TO *US*

Over the years hundreds of manufacturers have been bringing their packaging problems to *US*. Solutions are prompt and profitable because *US* has the machines plus an unusual engineering background.

US has machines available for net weighing, gross weighing and packing all types of powdered and granular materials, as well as equipment for package forming and filling, cartoning, carton sealing, lining and wrapping and paper box forming.

If you package coffee or tea, hard candies or cereals, in fact almost any dry food, it will pay you to call on *US*.

US AUTOMATIC BOX MACHINERY CO., INC.
200 ARBORETEUM RD., BOSTON 31, MASS.



Press Association

ENGLISH HARVESTER

Here is a potato harvester, developed in England, that is said to dig, clean and bag 3,360 lb. of potatoes an hour. Driven by tractor, it has two sections—a digger to lift and clean the spuds and a conveyor to deliver them to the bags.

of Plant Industry in cooperation with State Experiment Stations and sugar companies. The work on beets will be done at Salt Lake City, and cane at Houma, La. Sugar loss through respiration of the stored beets or cane, and rotting, are the major problems to be investigated.

Insect Damage

Decreased insect damage in stored cereals and seeds will be the goal of a project to be carried out under the supervision of the Bureau of Entomology, with cooperation from the Bureau of Plant Industry, State Experiment Stations in Kansas, Minnesota, and Georgia, and other groups. Commercial scale studies will be conducted all the way from the farm bins to the finished product warehouses.

More efficient marketing of livestock is the goal of the research project to be supervised by the Bureau of Agricultural Economics, with cooperation of other U.S.D.A. agencies and with the eleven Western State Agricultural Experiment Stations. Headquarters for the project will be Denver, Colo., under the leadership of a technical advisory committee consisting of Professor E. L. Potter of Oregon, Dr. W. P. Thomas of Utah, F. W. Beier, Jr., of Colorado, and Dr. R. T. Burdick, chairman, also of Colorado. This project will be coordinated with a similar study in the North Central States.

New packaging for dry beans, peas, and rice will be sought in a project to be conducted by Production and Marketing Administration with the cooperation of industry.

Sugar preferences and uses will be the object of a research project also to be directed by P. M. A. The increased use of corn sweeteners and the use of cane and beet sugar in liquid rather than dry form in recent years will be examined in an attempt to determine the extent, nature, and effect of these new practices. Cooperation with Bureau of Agricultural Economics, Bureau of Home Economics, Bureau of Chemistry, the Department of Commerce and trade research organizations will be sought.

Cereal Grains

New uses for cereal grains, when they are again in surplus, are the objectives of a project authorized for the Northern Regional Research Lab at Peoria. The Grain Advisory Committee recommended that all phases of wheat milling technology, food uses, and industrial uses be examined. Production and non-food utilization of the starch, protein, and oil constituents of the cereal grains will be coordinated with studies of a similar nature already under way at Peoria. Motor fuel investigations will be considered, along with microbiological studies.

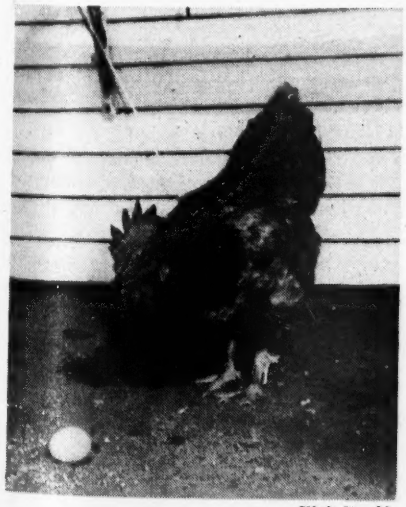
New uses for dried beans and peas, both for food and industrial products, will be the goal of a project approved for the Western Regional Lab at Albany, Calif. It is hoped that the high protein and starch content of these agricultural commodities will suggest new industrial products.

New uses for cottonseed and

other cotton byproducts will be sought in a project approved for the Southern Regional Lab. Cooperation with various cottonseed processing mills in the Southern States is planned. Contemplated at this time is an evaluation of the fractionation method developed at the Southern Lab for separating cottonseed oil, meal, and pigment glands. New uses for the pigment glands and utilization of cottonseed protein fiber will also be studied.

New uses for rice and rice byproducts will be investigated under a project to be studied at both the Southern and Western Regional Labs. Cooperation is planned with the Bureau of Plant Industry, various State Experiment Stations, rice producers, and processors. Non-food uses for the product are contemplated for the time when a world surplus of rice is "expected in the not too distant future." Improved keeping quality of stored brown rice and rice bran is hoped to result from this work.

Superior beef, more economically produced, is the goal of a new research project to be supervised by Bureau of Animal Industry. Cooperation with State Agricultural Experiment Stations in various parts of the country is being planned. It is obvious that the results from this project will require considerable time for identifying the superior lines of breeding and reaching the point where "truly superior breeding animals can be placed on farms and ranches of the country." The Livestock Advisory Committee recommended that such studies be inaugurated, as well as continuing the similar breeding studies by U. S. D. A. with sheep and hogs.



Wide World

GENERAL CONFUSION
The head and crow are those of a rooster, but the body lays eggs. Francis/es lives in Wichita, Kans., and is here seen contemplating his/her latest creation.

LARGE STOCKS of TUBING

for Prompt Delivery

Ryerson stocks include low carbon, cold drawn, seamless mechanical tubing, both regular and pump cylinder finish, and high carbon tubing, all in a wide range of sizes. Seamless and electric welded boiler tubes, and Allegheny Stainless tubing and pipe are also on hand. Drawing on these diversified stocks will save money because close Ryerson quality control assures tubular products that meet exacting requirements of analysis, size and finish. For all tubing requirements phone, wire or write the nearest Ryerson plant.

JOSEPH T. RYERSON & SON, INC., Steel-Service Plants at: Chicago, Milwaukee, Detroit, St. Louis, Cincinnati, Cleveland, Pittsburgh, Philadelphia, Buffalo, New York, Boston, Los Angeles.

OTHER PRODUCTS:	
Bars	Tool Steel
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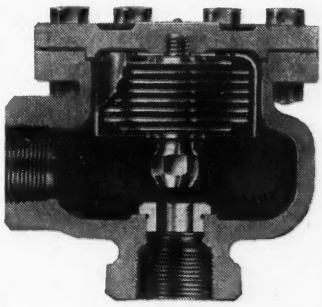
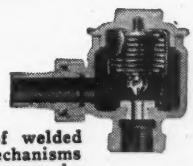
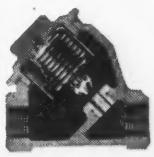
NICHOLSON OFFERS

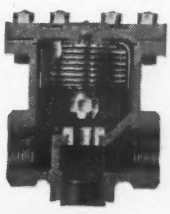
SIMPLE TRAPS *for today's* COMPLEX PROCESSES



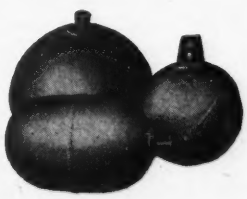
Distinguished by their simplicity, compactness and positive action, Nicholson steam traps are increasingly recommended for the requirements of recent technological advances. They simplify quality and heat controls; cut "down time" and maintenance.







HIGH-PRESSURE FLOATS in all sizes and shapes. Nicholson is one of the largest makers of welded floats for operating mechanisms and as H.P. storage vessels. Bulletin 746.



5 TYPES FOR EVERY APPLICATION—process, power, heat. Unequalled fast action. Installations show production increases up to 30%. Size ¼" to 2"; pressures to 225 lbs. Bulletin 544 or see Food Industries Catalogs.

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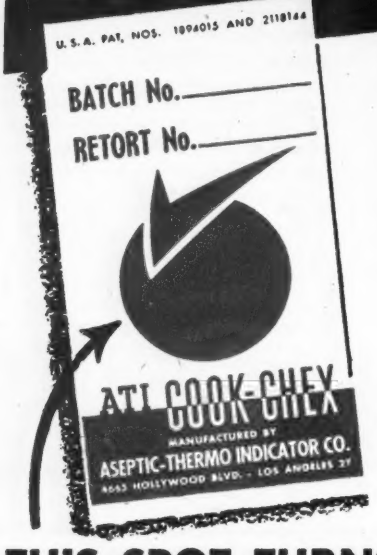

THIS SPOT TURNS Green

To eliminate the waste and embarrassment of uncooked goods in your plant, just place a Cook-Chex Retort Tag on each basket before cooking. Look at each tag before unloading. If tag is purple, food has not been cooked. If green, cooking has been completed. That's all there is to Cook-Chex. Simple, accurate money-saving. Price: $9.75 per M—less than 1/50¢ per case.

THIS METAL CONTAINER is a practical, sturdy holder for Cook-Chex tags. Write for FREE sample holder and tags, with complete facts and directions.

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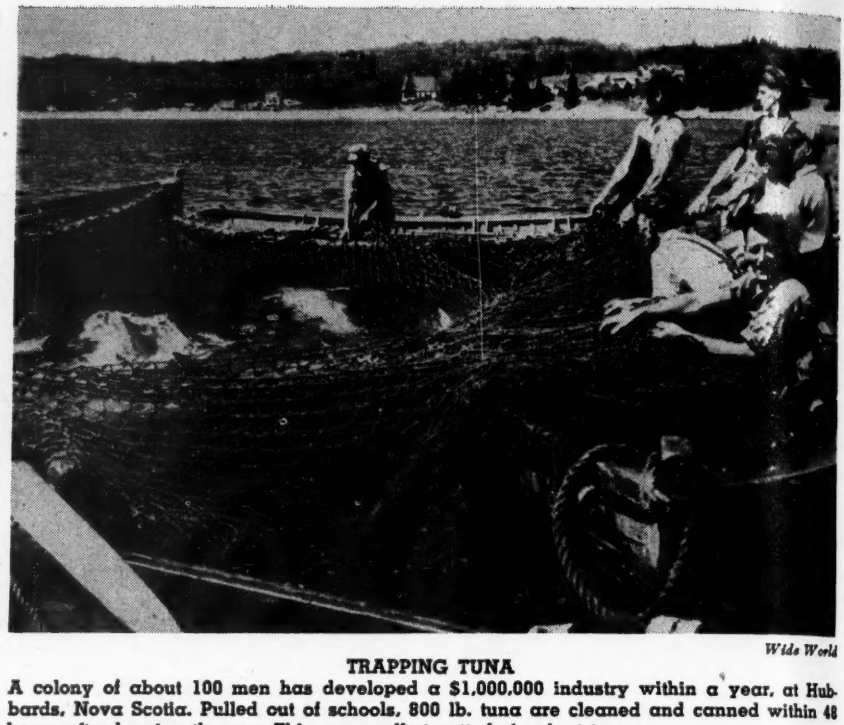
MANUFACTURED BY
ASEPTIC-THERMO INDICATOR CO.
4663 HOLLYWOOD BLVD. - LOS ANGELES 27



Wide World

TRAPPING TUNA

A colony of about 100 men has developed a $1,000,000 industry within a year, at Hubbards, Nova Scotia. Pulled out of schools, 800 lb. tuna are cleaned and canned within 48 hours after leaving the sea. This group effort netted six giant tuna.

New Standards Program Stepped Up by USDA

THE fruits and vegetables for which grade standards will be set up or amended by the Department of Agriculture during the balance of the current fiscal year have been listed by the standardization division of the fruit and vegetable branch of the Production and Marketing Administration.

The tentative program calls for the following standards:

Canned products—new standards for white potatoes and cucumber pickles; revised standards for asparagus, beets, spinach, and fruit jam and preserves.

Frozen foods—new standards for pineapple; revised standards for raspberries, strawberries, broccoli, and asparagus. The three fruits are expected to be completed before the vegetables.

The division has, of course, a lengthy list of other fruits and vegetables for which new or revised standards are felt to be necessary. However, the work outlined above is about all that the division can process by June 30, 1948.

The research work on frozen asparagus will probably be held up, it was stated, until such time as the Food & Drug Administration holds hearings on standards for this product.

With funds made available under the Research and Marketing Act, the standards personnel in agriculture hope to do a more thorough job of preparing their information and writing their tentative standards. Their aim is to take technical field representatives who have become specialists in certain fruits or vegetables over into the research side when standards are being revised or first written. These field men will be given the assignment of studying and reporting the practices of the industry involved.

Other Developments

Other standards developments at the Department of Agriculture include the following:

Frozen spinach—effective earlier this month were a few minor revisions in the standards for frozen spinach. No changes were made in the standards for particular grades, but there were clarifications of the determinations of grit and silt. Also the proposed rules published in April included a method of determining "drained net weight" even though drained net weight was not included as a factor of quality for determining grade. The final rules as published in the Federal Register omit any reference to drained net weight. The department officials ran into wide differences of opinion, and therefore decided to postpone defining "drained net weight" until additional data became available.

Frozen grapefruit—for the first time, standards are set up on this food. Details of the proposals were published in the Federal Register October 18, 1947. Members of the industry and other interested parties are given until mid-November

to file written data, views, or arguments for consideration. Department officials claim that the greatest difficulty in writing these standards revolved around the question of seeds. Under the subhead "absence of defects," the standards as proposed now define a seed as "any seed . . . that measures more than 3/16 inch in any dimension." A large seed is defined as one that "measures more than ⅜ inch in any dimension." Anything smaller than 3/16 inch in its longest dimension is not a seed, for the purposes of the proposed grade standards.

Olive oil—new grade standards for olive oil are also proposed through publication of the tentative standards in the Federal Register of October 23. The proposed standard, urged by domestic olive oil producers, may be considerably altered from the specifications as written contained in the proposed standards. Importers of olive oil have queried agriculture officials as to the possible effect of such standards on their operation—and they have been informed that these U. S. grade standards are permissive for both domestic and imported products; there is nothing mandatory about them.

As forecast previously, the tentative order for canned oysters standards of identity and fill of container has been issued, beginning on page 6699 of the October 10 Federal Register. This tentative order has brought forward considerable discussion, particularly from the West

Press Association

NO INTERLOPERS

This might have been the first contest in pretzel bending, but the contestants, hailing from the pretzel territory, were old hands at the business. The winner was Roland Hunsicker, of Allentown, Pa., who twisted 41 pretzels per minute. The women's title went to Mary Kulp, Lansdale, Pa.

Lo-Bax is "fast on the trigger" . . . quickly kills bacteria that threaten the quality of your food products.

Lo-Bax, the concentrated, efficient chlorine bactericide, helps prevent costly food spoilage and improves quality standards by rigidly controlling bacteria and sanitizing all surfaces with which food comes in contact.

Easy to handle, Lo-Bax kills bacteria almost instantly . . . at low cost. It contains 50% available chlorine, dissolves quickly in water—hot or cold, hard or soft—to make clear rinse solutions.

To make certain that you have safe, sure control over bacteria, order Lo-Bax from your supplier today.

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Pioneer Manufacturers of Chlorine Products for Nearly Fifty Years

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CHLORINE BACTERICIDE
50% AVAILABLE CHLORINE

LO-BAX SPECIAL—a superior chlorine bactericide in granular form—packed in 2½-lb. bottles, ½ doz. to the case; and in 1-lb. bottles, 1 doz. to the case.

LO-BAX POWDER—a highly efficient chlorine bactericide packed in 1¾-lb. bottles, 1 doz. to the case.

Lo-Bax . . . Super-Nufos . . . HTH-15 Dry Ice . . . Carbonic Gas . . . Ammonia, Anhydrous & Aqua . . . Caustic Soda . . . Soda Ash . . . Bicarbonate of Soda . . . Liquid Chlorine . . . Chlorine Dioxide . . . PH-Plus . . . Sodium Chlorite Products . . . Sodium Methylate

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SAVE up to 50% on MILL COSTS with

MOREHOUSE HY-R-SPEED MILLS

MODEL SB-1400 (18" x 5") for processing non-corrosive materials

MODEL SS-20 (20" x 5") (Stainless Steel) for corrosive materials

Multiply production—Improve quality—Save space

Now you can have processing equipment that is amazingly compact, versatile and efficient at half the cost of old style mills. Occupying only a fraction of the space required by ordinary units, these new Morehouse models produce several times as much —better and more efficiently. They are designed for use on a wide range of materials, both wet and dry. Adjustment is quick and easy, either for individual materials or methods of processing including

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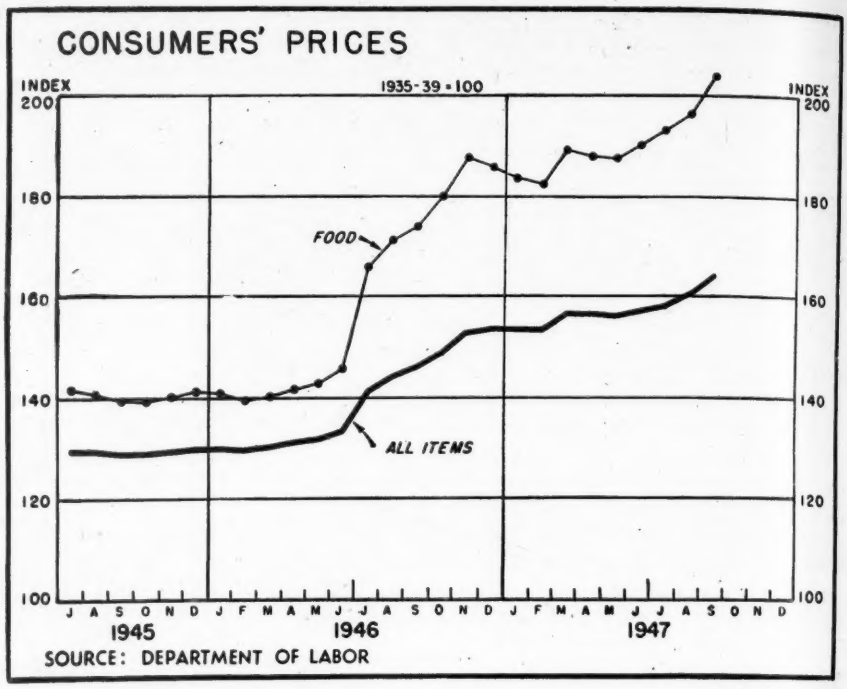

Press Association

LOOKS LIKE INFLATION

The President's council of economic advisors used this chart to show that "serious inflation of food prices is already here." They recommended return to partial controls.

Coast. An extension to November 29 was granted by the Administrator from the date originally announced for filing exceptions.

Also as anticipated, the final order on canned fruits with rum has been issued on page 6907 of the October 23 Federal Register. This final order confirmed the tentative order previously reported (FOOD INDUSTRIES, October, page 131). The new standards cover canned peaches with rum, canned apricots with rum, canned pears with rum, and canned cherries with rum. No standard of identity for fruit cocktail with rum was proposed.

Rumors of amendments to the existing standards on canned beans and on flour are still circulating. Indications are that a canned bean amendment hearing will be called by F. & D. A. if the industry submits convincing evidence that a change would be desirable. Washington officials believe that the industry is compiling its facts so that a documented request may be made.

Revision of the flour standards in regard to permissible bleaching agents is a possibility depending on research results from nitrogen trichloride studies. Whether the hearing would be to amend the present flour standards, or under Section 406 to establish tolerance limits for a poisonous ingredient, has not yet been made clear.

DEVELOPMENTS IN DISTRIBUTION

Cheese Tariff Change Proposed by Treasury

A TARIFF rate change proposed by the Bureau of Customs recently would have the net effect of lessening somewhat the duty assessed against certain types of imported cheeses. The amendment to the Customs Regulations would raise the weight allowance on the undutiable coverings of certain cheeses —coverings which are inedible, but not readily removable from the cheese.

Heretofore the percentage allowance has been one percent for all cheeses of this classification. The amendment proposed last month would list the new weight allowances as follows: Asiago, Cremonese, Parmesan, Parmigiano, Reggiano, Raggianito, and Trabolgiano, one percent; Cotrone, Moliterno, Moliterno type, and Palmese, two percent; and all others of this classification, two and one-half percent.

Delay Campaign

MILLERS' NATIONAL FEDERATION has postponed its plans for nationwide industry advertising in connection with its long-range pro-

gram. The executive committee decided that the program would be untimely in view of the uncertainties and confusion in the food supply situation. The special meeting of the federation in St. Louis Nov. 3-4 for launching of the advertising program has been canceled. The sixteen regional merchandising meetings scheduled to begin in Boston, Mass., Nov. 10, were postponed indefinitely.

Canned Foods Cling To Low Price Line

CANNED fruits and vegetables can be bought at lower prices than a year ago, according to a survey of retail prices in 14 representative markets made by the National Canners Association of Washington, D. C., and reported to the fall meeting of the Michigan Canners Association by Carlos Campbell, executive secretary of the national organization. Comparative figures revealed that in the majority of instances canned food prices are down from last year's level, when price ceilings for most canned items were still being reflected—a leftover from OPA days.

The findings of the retail price study, which compared prices of Oct. 1, 1946, with Oct. 1, 1947, for the same grade, brand, can size and retail store are: "Of the 10 canned vegetables studied, all but one were lower in price than a year ago and of the eight canned fruits all but two were selling at prices lower than the 1946 date."

WATERLESS FUN
In case you care, the young lady is "bobbing for oranges," which is Florida's version of the ancient Halloween game.

FOOD PROCESSING EQUIPMENT *A Problem?*

Tidewater RED CYPRESS

IS YOUR ANSWER!

A PROVEN FACT: Tidewater Red Cypress does not impart odor, taste, or discoloration to food with which it is brought into contact. This fact alone makes it ideal for such items as fermenting vats, processing tables, churns, pickle containers, etc.

A PLUS VALUE: This outstanding wood also offers extraordinary resistance to deterioration when used under adverse conditions such as extreme dampness, heat, etc.

Tide Water Red Cypress "The Wood Eternal"

LET US HELP YOU. WE INVITE INQUIRIES CONCERNING ALL TYPES OF TANKS AND VATS — FULLY FABRICATED OR PARTIALLY FABRICATED

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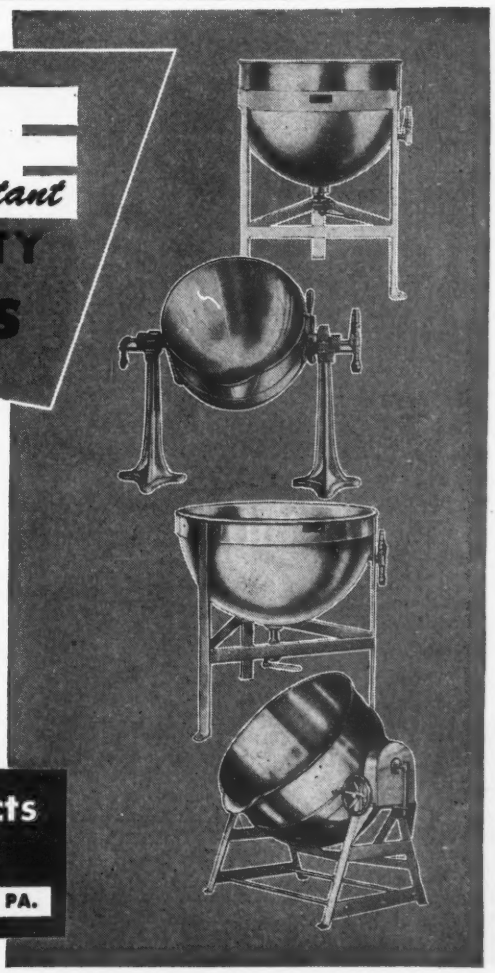
LEE *Corrosion-Resistant* HEAVY DUTY **Kettles**



Experienced LEE engineers and master craftsmen, with complete modern shop facilities—a flexible production organization—enables LEE to build the type of industrial corrosion-resistant KETTLES you need, *in any desired size.*

All Lee Kettles are made to ASME Code and Certificates furnished with each job.

Write for Descriptive Bulletin

LEE Metal Products Company, Inc.
415 PINE ST. PHILIPSBURG, PA.

When A
"Better Mouse-Trap"
ISN'T ENOUGH
Specify
METHYL BROMIDE

You can't catch a cockroach with a mouse-trap!

But when properly applied by qualified industrial fumigators—Westvaco Methyl Bromide kills *all* insect pests *and* rids your property of rodents!

So the most economical *and the 24-hour* way to end this double threat to products and profits is to fumigate with Methyl Bromide!

Consult Westvaco

Without obligation we will survey your plant, suggest structural changes where needed, advise on practises that prevent the incursion of pests; and recommend (and assist) the industrial fumigators who will supply Methyl Bromide and any other equally toxic "spot" fumigants that may be needed to render and maintain your plant infestation free!

Address inquiries to our Agricultural Chemicals Division for this comprehensive and immediate service.

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Press Association

BACK TO FERTILITY IN ONE DAY
All kinds of help turned out for this effort to restore, in one day, the fertility of a 280-acre Ohio farm. One of the first projects was the construction of a pond, seen here in an early stage shortly after the workers began gouging out the bed.

Food Manufacturers' Sales and Costs Shown

NET sales of all food manufacturers in the United States for the first quarter of 1947 are estimated at a total of $7,133,700,000 in the first of a new series of reports on the financial condition and operating results of all U. S. manufacturing corporations. The reports are being made by the Federal Trade Commission and the Securities and Exchange Commission.

The income and expense breakdown from the first report reveals the following estimates (in millions of dollars) of food manufacturers' operations for the first quarter of this year, compared with all manufacturing corporations:

	Food	All Mfg.
Net sales	$7,133.7	$35,553.7
Costs and expenses	6,558.7	31,184.2
Net operating profit	575.0	4,369.5
Net income after taxes	331.6	2,664.0
Dividends paid	115.2	662.7

The report set the total current liabilities for food producers at $2,743,300,000, compared with current assets of $7,335,100,000.

Military Needs Listed For Beans and Onions

THE office of the Quartermaster General last month revised the estimated military requirements for dried beans and onions from the 1948 crop. Original requirements were first announced in September.

The quantities are as follows:

	Original (pounds)	Revised (pounds)
Kidney beans	2,480,000	1,284,000
Lima beans	7,032,000	706,000
White beans	14,002,000	4,379,000
Dehydrated onions	1,330,000	2,128,000

The requirements for dried peas, 1948 crop, were announced for the first time last month as 2,128,000 lbs.

Inspection Costs Rise On Fruits, Vegetables

THE cost of inspection of fruits and vegetables by government inspectors has headed upwards, along with the costs of other goods and services. Last month, the Department of Agriculture published its intention of raising the fee for inspecting carlots from $5.00 to $6.00; less-than-carlot rates from $3.00 to $4.00; and the maximum fee for inspecting a carlot of mixed products from $9.00 to $12.00.

The carlot and less-than-carlot fees were raised $1.00 each, the maximum fee for mixed carlots was raised $1.50 in August, 1945.

Close Bakery

WITH the sale of its Dayton, O., plant property to the Frigidaire Division of General Motors Corp., Carr-Consolidated Biscuit Co., through J. B. Carr, president, announced last month that cracker and cookie production in that city would be discontinued early next spring. Dayton operations thereafter will be confined, in new quarters, to sales, warehousing and distributing activities. Production subsequently will be diverted, Mr. Carr said, to the company's modern bakeries in other centers.

Condensed Milk

THE Board of Directors of the American Bulk Condensed Milk Association at its Fall Meeting approved tentative standards for top quality bulk condensed milk as recommended by the Association's committee on research and quality control.

They are described as minimum standards recommended to the in-

dustry for voluntary acceptance. They are the same or higher than those required by the F&DA. General acceptance of them, it was pointed out, is in the interest of stabilizing the bulk condensed milk business as to product composition and quality.

Monthly Inventory

A MONTHLY summary of grocery sales trends has been inaugurated by the Grocery Manufacturers of America. The summary, prepared by Robert Bingham, GMA research economist, will be based on data compiled from the newly expanded monthly grocery inventory findings of the Bureau of Advertising.

Developed as an advertising aid, food industry leaders regard this inventory as an important new source of assistance in the distribution of their products. The inventory will include the movement of all brands with more than 10 percent distribution in the leading markets from coast to coast in 35 product classifications. Along with brand names, the report will include size of units and total sales.

QMC Revision

FIGURES have been revised on canned fruits and vegetables to be bought by the Quartermaster General for Army use from the 1947 pack. The revision shows increases from previously announced figures for four fruits and five vegetables, and decreases on 11 canned fruits and 11 vegetables.

VISITING TECHNOLOGIST

Frode Bramsnaes, chief assistant, Food Preservation Laboratory, Technical University, Copenhagen, Denmark, is visiting the U. S. under a fellowship sponsored by the Scandinavian-American Foundation and Otto Moensted, leading margarine manufacturer. He is making a study of fresh fruit and vegetable processing, giving particular attention to current laboratory research.

Guardians OF THE NATION'S FOODS

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UNITED STATES COLD STORAGE

Four Modern Fortresses For Guarding The Nation's Foods

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WRITE FOR DETAILS

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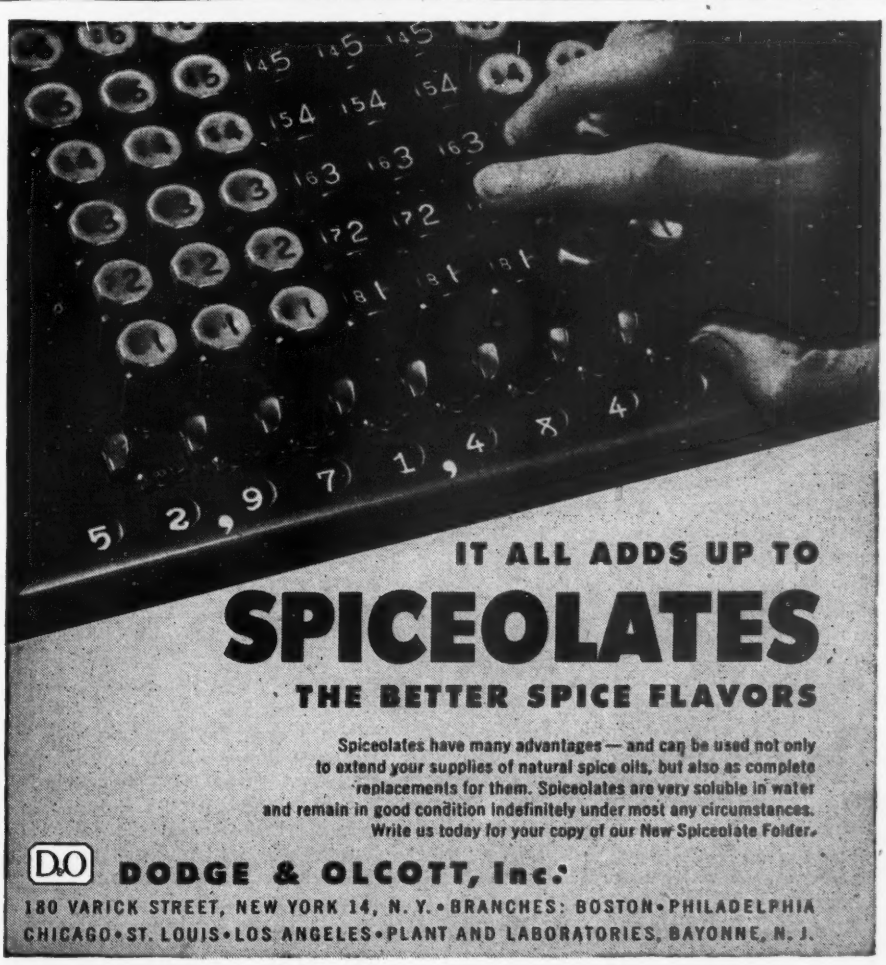

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THE BETTER SPICE FLAVORS

Spiceolates have many advantages — and can be used not only to extend your supplies of natural spice oils, but also as complete replacements for them. Spiceolates are very soluble in water and remain in good condition indefinitely under most any circumstances. Write us today for your copy of our New Spiceolate Folder.

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RAW MATERIALS

Yeast From Wood Gains Interest of Industry

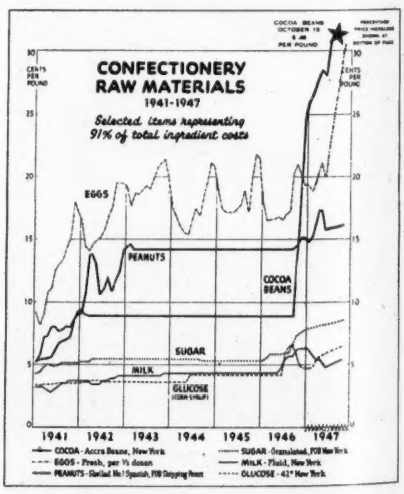
YEAST grown on wood-sugar solutions, resulting from hydrolysis of waste wood, is a possibility at the Springfield, Ore., plant originally and primarily designed for production of alcohol. Anheuser-Busch has admitted such an interest in the government disposition of this surplus property.

Appraisal and advertising of this plant by War Assets Administration is expected to be complete by the end of the year. Normally a thirty-day period for bids would then be allowed. Interested lessees or purchasers could expect to obtain a contract about the first of February, if present expectations materialize.

Forest Service technologists responsible for the basic processes employed in this plant will welcome discussion with any interested groups. A number of concerns have been investigating the alcohol (rather than yeast) possibilities at that location. Both local lumber interests and national chemical manufacturers are awaiting the disposition of this plant with interest.

Malt Returned To Export Control List

RE-CONTROL of malt for export was imposed, in late October, by the Department of Commerce in an action which restores the commodity to the Positive List of controlled



CONFECTIONERS' COSTS

A National Confectioners' Association survey reveals that raw materials prices are still on the increase. This chart shows the percentage of gain since Jan. 1, 1941. The gain in coco beans is 823 percent; eggs, 231; peanuts, 210; sugar, 95; milk, 72; and glucose, 97 percent.

export items, effective October 24.

The department said that the return of malt to specific licensing for export was taken after consultation with the Departments of State and Agriculture, and in support of the food conservation program to provide grain for Europe.

The department also stated that no export quotas for malt and no further export quotas of barley for malting purposes will be established at this time. Barley is already on the Positive List and all barley shipments are made under allocation by the International Emergency Food Council.

Since malt was decontrolled on March 17, 1947, exports have been running at the rate of about 1,000,000 bushels a month.

SCHEDULE OF EVENTS

December

1- 6—21st Chemical Industries Exposition, Grand Central Palace, New York.
3- 5—National Association of Manufacturers, 52nd congress, Waldorf-Astoria, New York.
3- 5—Tri-State Packers Association, fall convention, Hotel Traymore, Atlantic City, N. J.
8-10—American Society of Refrigerating Engineers, 43rd annual meeting, Hotel Traymore, Atlantic City, N. J.

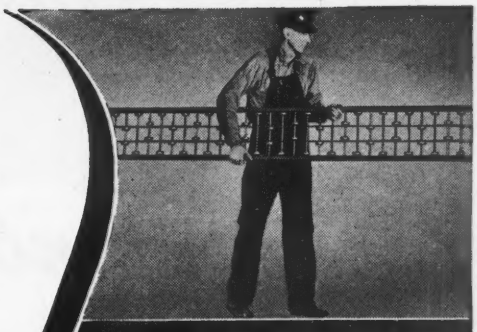
January

7- 9—Northwest Canners Association, annual meeting, Multnomah Hotel, Portland, Ore.
11-13—National Preservers Association, annual meeting, Stevens Hotel, Chicago.
12-13—Southeastern Frozen Foods Association, annual meeting, Biloxi, Miss.
12-16—Second National Materials Handling Exposition and Conference, Public Auditorium, Cleveland.
13-16—National Food Brokers Association, annual meeting, Atlantic City, N. J.
16-17—National Pickle Packers Association, winter meeting, Hotel New Yorker, New York.
17-23—Canning Machinery and Supplies Association, annual exposition, Public Auditorium, Atlantic City, N. J.
18-21—Food Industry Exposition, Steel Pier, Atlantic City, N. J.
18-23—National Canners Association, 41st annual convention, Auditorium, Atlantic City, N. J.
19—National-American Wholesale Grocers, annual convention, Atlantic City, N. J.
19-31—Pennsylvania State College, Ice Cream Short Course, for plant personnel, State College, Pa.
22-23—National Dairy Council, annual winter conference, Hotel Schroeder, Milwaukee, Wis.
26-29—Refrigeration Equipment Manufacturers Association, 5th All-Industry Exposition, Public Auditorium, Cleveland, Ohio.

February

1- 3—Institute of American Poultry Industries, fact finding conference, Kansas City, Mo.
2- 6—American Society of Heating and Ventilating Engineers, 8th International Exposition, Grand Central Palace, New York.
7- 8—Refrigeration Research Foundation, annual meeting, Haddon Hall, Atlantic City, N. J.

Need any one or all Three?



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Write for "Conveyors by Standard" Bulletin No. FI-127 — a valuable conveyor reference book that will be useful to you.

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Protecting the health and good will of all ultimate consumers of dairy, beverage, and food products is of utmost concern to the continued successful operation of these important industries. There is no greater protection against product contamination than the use of Tri-Clover sparkling clean Stainless Steel or Tri-Alloy Sanitary Fittings, Valves, and Pumps, together with Stainless Steel Tubing, to obtain fully approved liquid conveying lines. Literature will be sent on request.

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MACHINE CO.

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TRIALLOY AND STAINLESS STEEL SANITARY FITTINGS, VALVES, PUMPS, TUBING, SPECIALTIES

FABRICATED STAINLESS STEEL INDUSTRIAL FITTINGS AND INDUSTRIAL PUMPS

THE Complete LINE

Changes in Food Supplies

(Indicators)

Production

Creamery butter declined to 101,465,000 lb., in September, a seasonal decrease of 13 percent from August. While this is sharper than the 9 percent August-September decline last year, it is less than the 1941-45 average decline of 17 percent.

American cheese production in September, estimated at 74,535,000 lb., dropped 17 percent below August, but was still the largest September production on record. The seasonal decline last year was 14 percent, while the five-year average was 15 percent.

Ice cream production dropped 19 percent below August, in September, being estimated at 61,350,000 gal. It was, however, only 1 percent under last year's all-time September high. Last year's seasonal decline was 20 percent, and the five-year average is 14 percent.

Liquid egg production totaled 10,255,000 lbs. during September, 43 percent less than the September output a year ago when 17,991,000 lb. were produced. Dried egg production was only 158,000 lb., compared with 4,735,000 lb. for September a year ago. Frozen egg output, on the other hand, was over three times that of September, 1946, coming to 9,163,000 lb.

The canned apricot pack this year is approximately 30 percent under 1946 production in the estimates of the National Canners Association. Only 3,261,739 actual cases were processed, which compares with last year's pack of 10,802,202 actual cases.

The canned sweet cherry pack came to 643,385 actual cases, which is down about 69 percent from last year's 2,082,251 cases, according to the National Canners Association.

Canned red pitted cherries were also down from last year, the National Canners' estimates showing a pack of 2,396,834 actual cases, or about 22 percent below the 1946 pack of 3,085,872 cases.

Chicks hatched by commercial hatcheries during September totaled 32,069,000, 8 percent larger than the September, 1946, hatch, but 11 percent less than the 1941-45 average of 36,152,000 for the month.

Materials

Cabbage for kraut being produced on contract acreage was estimated in mid-October, at 43,450 tons, far below last year's output of 147,400 tons.

Beets for canning were estimated at 66,000 tons, which is less than half the 135,800 tons grown for canning in 1946.

Tomatoes for processing are estimated at 3,410,000 tons. This compares favorably with last year's production of 3,380,000 tons.

Sweet corn for processing is estimated to reach 1,130,300 tons, which is closer than expected to the 1946 production of 1,228,800 tons.

Apple production is estimated at 112,910,000 bu., which compares with last year's harvest of 119,410,000 bu.

Pear production is estimated at 35,048,000 bu., an increase over last year's 34,447,000 bu.

Stocks and Storage

Frozen fish and shellfish held in storage October 1 totaled 136,074,470 lb. This compares with 147,084,636 lb. held a year earlier.

Freezer occupancy was 81 percent filled on October 1, up 1 percent from September 1. Cooler occupancy dropped to 74 percent on October 1, from the 76 percent of September 1.

Indexes

The commodity price index on food, compiled by the New York Journal of Commerce was 204.1 for the week ending November 8, which compares with 203.0 for the preceding week, and 207.6 for October.

Business Week's index of business activity was 185.6 for the week ending October 4, as against 185.7 for the preceding week, 183.2 a month ago, and 184.8 a year ago.

CONSTRUCTION NEWS

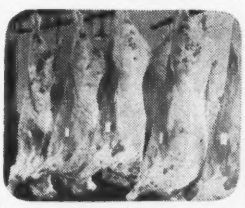
	Pending (thousands)	Total Awarded Nov. (thousands)	Total Awarded 1947 (thousands)
Bakery	$ 235	$ 61	$16,612
Beverages	955	232	34,309
Canning and Preserving	100	...	534
Cold Storage	255	...	4,290
Confectionery	155	...	1,364
Grain Mill Products	1,125	...	29,597
Ice, Manufactured	75	...	355
Meats and Meat Products	1,025	250	6,105
Milk Products	1,765	...	8,321
Miscellaneous	1,095	250	16,350
	$6,785	$793	$117,837

Locker Plants Prefer

FRICK Refrigeration

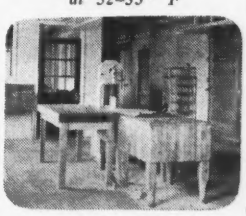
Because it keeps the various rooms at the temperatures wanted, with the greatest convenience and dependability.

The Elmer Plant Has 500 Lockers



Freshly Killed Meat at Gaskill's

Aging Room, Held at 32–35° F



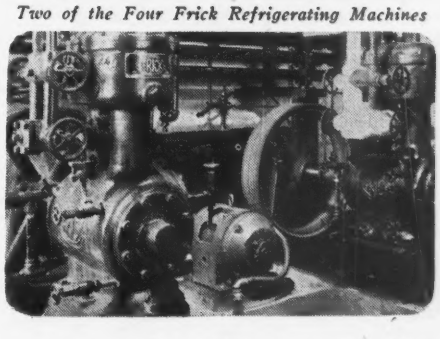
Well Equipped Processing Dept.

Witness the new plant of Norman Gaskill at Elmer, N. J., among hundreds of others. This has five rooms, all at different temperatures, and specializes in slaughtering, processing and quick-freezing. Locker renters in a 30-mile circle come to Gaskill's for these services. Four Frick refrigerating machines — two handling ammonia and two Freon-12—carry the cooling load.

Get the whole story of Frick refrigeration and Frick-Knickerbocker lockers: write

FRICK CO. — DEPENDABLE REFRIGERATION SINCE 1882 — WAYNESBORO, PENNA. U.S.A.

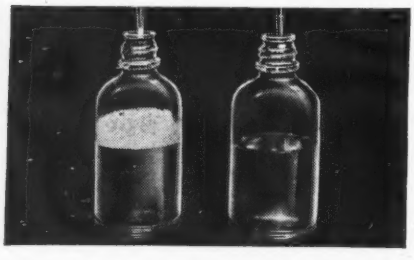
Two of the Four Frick Refrigerating Machines



Silicone News

DC SILICONES

Foam in Bottling
KILLED BY DC ANTIFOAM A



Foaming of solubilized perfume oils during bottling is a problem as illustrated at left. The problem is easily solved, however, by addition of minute quantities of DC Antifoam A, as shown in bottle at right.

Foam is fine for washing and shaving but in industry foam is almost always a problem and frequently a very costly one. It is especially troublesome in the automatic bottling of many water-soluble products. If those products are rare perfumes, foam can be very costly indeed.

In recent years makers of such products as perfumes, cologne and after-shaving lotion have been using emulsifiers in combination with perfume oils to form a crystal clear concentrate which can be diluted indefinitely with water. Several of the emulsifiers marketed by Atlas Powder Company, Wilmington, Delaware, under its Trade Mark "Tween," are used for this purpose.

These perfume solubilizers have many advantages over the solvent solutions previously used. Like all water-soluble emulsifiers, however, they are moderately active foamers in aqueous solution.

In a standard concentration of Tween 20 and perfume oil dissolved in water, the life of a unit volume of foam* is over 140 seconds. The addition of 0.3 parts of DC Antifoam A per million parts of the same concentrate reduces the life of a unit volume of foam to 3.9 seconds.

Such a striking reduction in foam life following the addition of such a very low concentration of DC Antifoam A is characteristic of this silicone foam killer. Its usefulness against foams in aqueous solutions and emulsions has been established in many different laboratory and industrial processes. The properties and some of the established uses for DC Antifoam A are described in pamphlet No. O 6-7.

*Measured according to the technique described by Bikerman (Trans. Far. Soc. 34,634).

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Dow Corning
FIRST IN SILICONES

What Washington Thinks

By R. S. McBRIDE, Washington, D. C.

EXPORT COMPANIES—Considerable readjustment of the ownership and control of companies organized under the Export Trade Act is being required in certain Federal Trade Commission rulings. Recently the Commission has required General Milk Co. to change its export practices in order "to operate in conformity with both the letter and spirit of the Act." One of the requirements was a modification of stock ownership. Another dealt with trademarks and label provisions. Numerous other requirements are imposed from time to time by F.T.C. as it seeks to control and eliminate what it considers abuses of the monopoly privileges in foreign trade, which are intended to eliminate many competitive elements that are required in domestic business. Food companies anticipating foreign business need to study recent complaints, stipulations, and decisions. They reflect a tightening of the application of the law as compared with wartime and prewar policies.

BYPRODUCT FEED—Byproduct recovery for feeds of waste pulp and protein often discarded at potato-starch factories is now an economic and social necessity. Often it is required also to prevent stream pollution. A recent government investigation has shown that batch-process recoveries yield lower returns than a modern continuous technic. By shift in one case a recovery of 71 percent was increased to 85 percent. Dollar benefits which come from greater recovery often more than pay for improved equipment and better controlled process. Comparable relations may be found in many other effluent control cases, one may safely assume.

CALORIES PER ACRE—For a long time farm economists have argued that the way to solve agricultural problems of surplus production is to grow fewer calories per acre. This means marketing milk, cheese, pork chops, and the like, instead of wheat, corn, and oats. World scarcity of foods has solved the feared "surplus" problem in quite a different manner. The problem now is to grow a maximum number of edible calories instead of a reduced number. All this is important as determining what raw materials can be expected from farms now and later. Once in a while it is important to go back to the fundamental issues involved and reconsider these factors which so largely influence supply of materials for food processing.

FOOD LOGISTICS—World War II created a new word for everyday American usage, "logistics." This is the science of getting things where they are needed in time to do some good. Food plant managements have logistic problems, too. In fact, the modern plant which attempts straight-line manufacture generally discovers that the problem of movement of commodity to the right spot at the right moment (not too soon and not too late) is the key to successful continuous straight-line manufacture. If processing in any individual plant is not proceeding smoothly, the experienced superintendent generally looks soon, if not first, at the mechanisms for materials handling to be sure that the right quantities reach each manufacturing operation in good order and exactly on schedule.

WHAT IS NET WEIGHT?—Many weights and measures inspectors want the weight of frozen food for which a charge is made to be that at the time of delivery to the retail customer, not the weight as packed. To that end they are encouraging packaging on which there will be no net weight marking but an indication that the weight is to be determined at the time of sale. Federal Food & Drug officials have not gone this far, at least not yet. Difficulty is anticipated on the commodities for which a fixed price per package is the basis of sale, as variable net weight in such packages

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New Title or Position .....

is not permissible under most weights and measures laws. Declaration of net weight at time of pack is not always acceptable. There remains quite a problem to be worked out by frozen food packers. The solution is neither obvious nor simple.

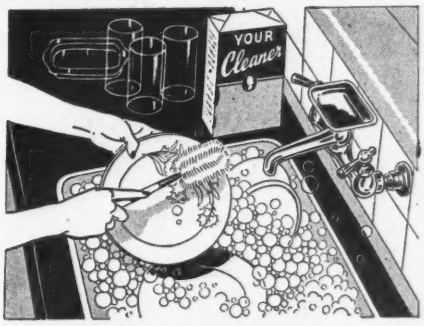
RESEARCH REPORT—The trend of official thinking on research supported by the government is clearly shown by the set of five volumes in "Science and Public Policy," the President's Scientific Research Board report to the President released this fall. As every employer of technical personnel knows, the real problem is to find qualified technical men in position to do research even when appropriations have been made. Food companies are no exception in the scramble to get such staff personnel, almost regardless of salary. Top executives in the industry must be helped to an understanding of the very high salary scale which is resulting.

MILK ORDINANCE—A revised recommendation is shortly to be issued by Public Health Service in its 1948 edition of "Milk Ordinance and Code Recommended by U. S. Public Health Service." The new Bulletin 220 will include the first extended revision since the issue of 1939, the first giving any amendments since December 1942. It is to be expected that many local and state groups will promptly adopt the new sanitary features recommended. Substantially all of these have been tried out in practice and are believed by the federal officials to be entirely practical of observance, with increased benefit in public health protection.

HIGH OUTGO—Disposable income of the general public has been at an all-time high recently. Unfortunately the necessary outgo has been relatively even higher. Official figures from all Government sources leave no doubt that in many divisions of human affairs greatly increased income has not kept up with the pocketbook demand. It is important to remember this fact when trying to figure out what Washington is going to do in the special session and the regular session of Congress. Amendment of human nature in these respects is much more difficult than amendment of the laws on the statute books.

PALLIATIVE ONLY—Interstate Commerce Commission gave the railroads emergency relief by granting a temporary freight increase of ten percent on most commodities, practically on everything of interest to the food industries. Unfortunately, that's not the last of the expected freight rate increases. Programming of the food business must therefore assume that we now have, and shall probably indefinitely have, frequently increasing incentive to save on quantity of foods moving by rail.

now available to help you clean up Santomerse № 1



Santomerse No. 1 in bead form is ready for packaging and sale as a household cleaner with no further processing or compounding. A tablespoon to a dishpan of water forms plentiful suds instantly, cleans thoroughly, rinses quickly and easily, leaves glassware sparkling clean without toweling.

the modern, all-purpose detergent and wetting agent

Increased facilities for the production of Santomerse No. 1 assure a plentiful supply of this modern, all-purpose detergent and wetting agent. Two forms of Santomerse No. 1 can be supplied—flake form, used extensively by industry for a multitude of cleaning jobs; bead form, which is better suited for household application . . . Quick facts about Santomerse No. 1 and a partial list of suggested cleaning applications are tabulated here.

Some Typical Opportunities for Cleaning Up with Santomerse No. 1

- Fruit and vegetable washing
- Automobile cleaning
- Dairy equipment cleaning
- Dishwashing
- Dry cleaning
- Glass cleaning
- Household cleaners
- Commercial laundries
- Household laundries
- Milk bottle cleaning
- Painted surface cleaning
- Railroad car cleaning
- Rug cleaner
- Wall cleaner
- Bubble bath preparations
- Fur processing
- Leather processing
- Metal cleaning
- Cold water paint manufacture
- Paper manufacture
- Paper stock de-inking
- Cotton dyeing, bleaching and finishing
- Rayon dyeing, bleaching and finishing
- Silk dyeing, bleaching and finishing
- Nylon dyeing, bleaching and finishing
- Jute, straw, hair and feather processing
- Wool processing
- Wallpaper remover

QUICK FACTS ABOUT SANTOMERSE No. 1

1. Combines cleaning action, wetting, dispersing, emulsifying, penetrating—all in the one product.
2. Speeds and improves cleaning by first making water wetter so that it spreads faster and penetrates deeper.
3. Quickly separates and removes imbedded or attached soil, breaks it up and keeps it in suspension so it cannot be re-deposited.
4. Functions effectively in hard or soft water . . . in acid or alkaline . . . hot or cold solutions.
5. Produces instant lather or foam in water solutions under all conditions.
6. Can be used alone or in combination with other materials such as alkaline builders.
7. Prevents formation of insoluble curds in hard water.

Get Complete Facts About Santomerse No. 1

Send for your copy of this new 28-page booklet containing full technical details and valuable application data on Santomerse No. 1. Write MONSANTO CHEMICAL COMPANY, Phosphate Division, 1700 South Second Street, St. Louis 4, Missouri, or any of the following District Sales Offices: New York, Philadelphia, Chicago, Boston, Detroit, Cleveland, Cincinnati, Charlotte, Birmingham, Los Angeles, San Francisco, Seattle. In Canada: Monsanto (Canada) Limited, Montreal.

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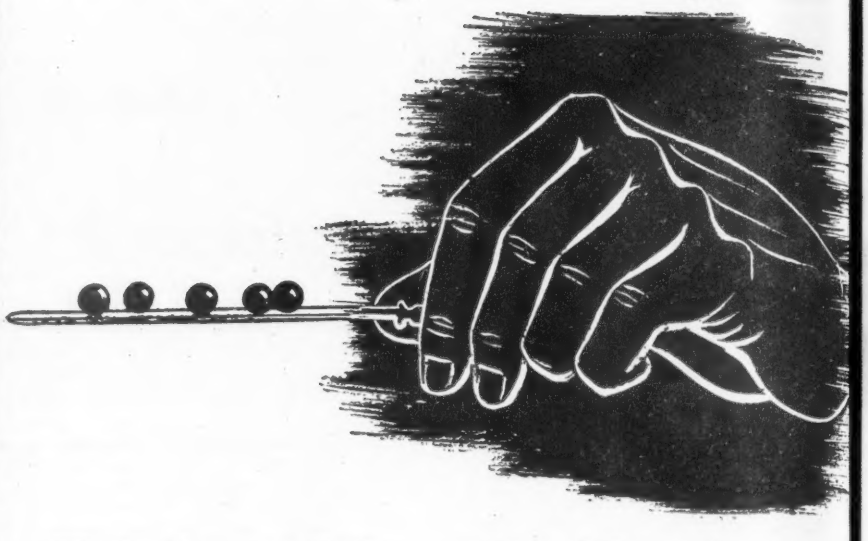
MONSANTO
CHEMICALS AND PLASTICS

SERVING INDUSTRY . . . WHICH SERVES MANKIND

it takes balance



Whether it's peas on a knife . . . or the emulsifier you choose for your needs . . . it takes balance!

Your emulsifier must be scientifically balanced to do precisely what you require. This is the basis upon which The Emulsol Corporation built its research in developing such outstanding products as:

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- Emcol RH: Self-emulsifying glyceryl monostearate —edible. Designed for Emulsifying, Plasticizing, Texturizing, Freshening, Bodying, Stabilizing.

And most keenly balanced of all . . . The Emulsol Corporation's recognized "know-how" technical services. Send us your problem on your letterhead and, at no obligation, we will give you the most effective answer.

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MEN • JOBS • COMPANIES

INDUSTRY

Abbott's Dairies, Inc., Philadelphia, has been nominated as one of the best managed companies in the United States. It is one of the 209 companies selected by bankers, businessmen and editors in a poll sponsored by the Committee for Economic Development.

Armour & Co. has announced its purchase of the Drummond Packing Co., Eau Claire, Wis. The plant has a capacity employment of 350 persons.

The Fresno Meat Packing Co., Fresno, Calif., has completed an expansion program at a cost of approximately $200,000. Included in the improvements are a concrete and tile addition to the old plant, new equipment throughout and stock pens designed to make it unnecessary for the driver to enter the enclosure.

Hollywood Brands, Inc., Centralia, Ill., has purchased the Okmulgee Nut Company, Okmulgee, Okla. Hollywood Brands anticipates processing 12,000 tons of peanuts a year at its new unit.

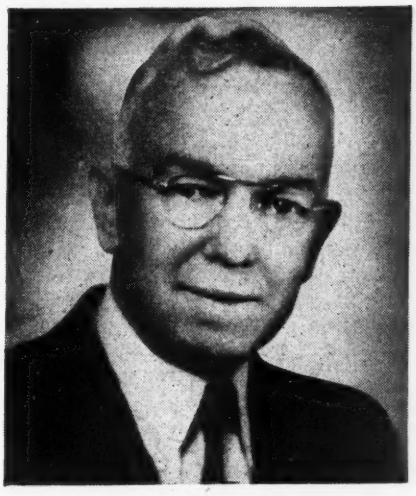
Kraft Foods Co. will erect a limburger cheese factory at Clayton, N. Y., according to Roscoe A. Page, vice-president and production manager of the company. Work on the $200,000 plant is expected to get underway in the spring.

Louisiana State University has erected a $100,000 food preservation center to serve as a model for similar community centers throughout the state. The preservation center contains refrigeration units, canning equipment and a food and nutrition laboratory which is under the direction of Dr. E. A. Fieger, nutritionist.

Minnesota Valley Canning Co., Le Sueur, Minn., recently purchased five canning plants formerly owned by the Iowa Canning Co., Vinton, Iowa. The plants are in Vinton, La Porte City, Shellsburg and Garrison, Iowa. They have a present capacity of 650,000 cases of peas and corn annually.

Old Dutch Foods, Inc., Buffalo, has acquired a new plant in Blasdell, N. Y. The company plans to spend $20,000 to remodel the unit for the manufacture of salad dressings and mustard.

Pi-Do Corp. has begun production in its newly completed building in Dallas, Tex.



HOWARD G. WASCHER

JOHN R. RHAMSTINE

Directors of Corn Products Refining Co., New York, have elected Howard G. Wascher as executive vice-president and John R. Rhamstine as vice-president. Mr. Wascher joined the company in 1908. He is a director of the company and vice-president in charge of foreign operations. Mr. Rhamstine has been with the manufacturing department since he became associated with the company in 1934.

WILLIAM F. SEALS

Manager of the Middle Atlantic region of the National Association of Manufacturers, William F. Seals has been elected executive vice-president of the National Peanut Council, trade association of the peanut industry with headquarters in Atlanta.

HAMILTON W. PUTNAM

Announcement has been made of the appointment of Hamilton W. Putnam as head of the food research division in the laboratories of the Central Soya Co., Inc., Fort Wayne, Ind. Mr. Putnam has been with the Igleheart unit of General Foods Corp.

PERSONNEL

D. S. Bentley, formerly vice-president in charge of production for Monarch Wine Co. of Georgia, Atlanta, has resigned to accept a position as sales engineer with Food Machinery Corp., Peerless Pump Division. He will make his headquarters for the present in Atlanta.

Johan Bjorksten, president, Bjorksten Research Laboratories, Chicago, has been elected director of the Association of Consulting Chemists and Chemical Engineers, Inc. He will serve for two years.

Robert C. Evans has resigned as general manager of the Florida Citrus Commission, after four years with the state group. Mr. Evans has not announced his future plans.

Charles W. Folds of Marshall Field & Co., Chicago, has been elected president of Frozen Food Foundation, Inc., Syracuse, N. Y.

J. J. Harris, formerly assistant to the director, customer research department of Continental Can Co., Chi-

The Efficient Separation *By Particle Size* of Dry Materials

Your copy of the new Bar-Nun Sifter Catalog will be forwarded to you immediately upon receipt of your request.

Bar-Nun Rotary Sifters, as described and illustrated in the new catalog shown at left, are sturdily constructed units which provide continuous and automatic separation, by particle size, of many types of dry, flaked, granular, or powdered food products. High capacity operation, minimum space and power requirements, and long-time, satisfactory service combine to make Bar-Nun Sifters unusually efficient production machines.

75TH YEAR

Gump Engineers, backed by 75 years' experience in the field of processing dry, flaked, granular, and powdered food products, will be glad to work with you in selecting the Gump-Built Equipment best suited to your specific requirements.

B. F. GUMP CO.

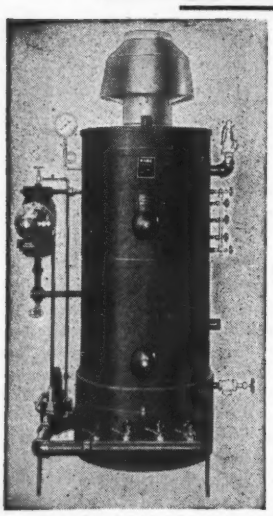
Engineers and Manufacturers Since 1872

454 SOUTH CLINTON STREET, CHICAGO 7, ILLINOIS

Makers of: **Equipment for Feeding, Grinding, Mixing, Packing, Sifting, and Weighing**

CLEAN STEAM

AT CONTROLLED TEMPERATURE

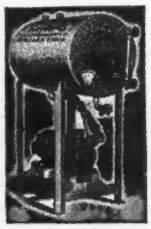


The KANE Boiler is built, in sizes 1 to 30 H.P., to A.S.M.E. specifications for operating pressures up to 100 lbs. Special boilers for higher pressures built to order.

. . . the Automatic Gas-fired

KANE BOILER

Compact, self-contained, and "tailor-made" for your job . . . includes: the study and solution of your problem; the correctly sized and constructed KANE Automatic, Gas-Fired Boiler; the M-K-O Automatic Boiler-Feed to provide a constant water level for highest boiler efficiency.



The M-K-O Automatic Boiler Feed returns condensate and supplies small quantities of hot water as needed to the KANE Boiler.

MEARS-KANE-OFELDT INC.

1903-1915 EAST HAGERT STREET, PHILADELPHIA 25, PA.

FOUR DECADES OF AUTOMATIC GAS-FIRED BOILER MANUFACTURING EXPERIENCE.

MAJ. GEN. RICHARD DONOVAN

Upon retirement from the U. S. Army, Maj. Gen. Richard Donovan has taken up his duties as vice-president and director of research of the Alford Refrigerated Warehouses, Dallas, Tex. He will head research at the company's two new buildings in Dallas.

cago, has been made sales manager at the company's Portland, Ore., office.

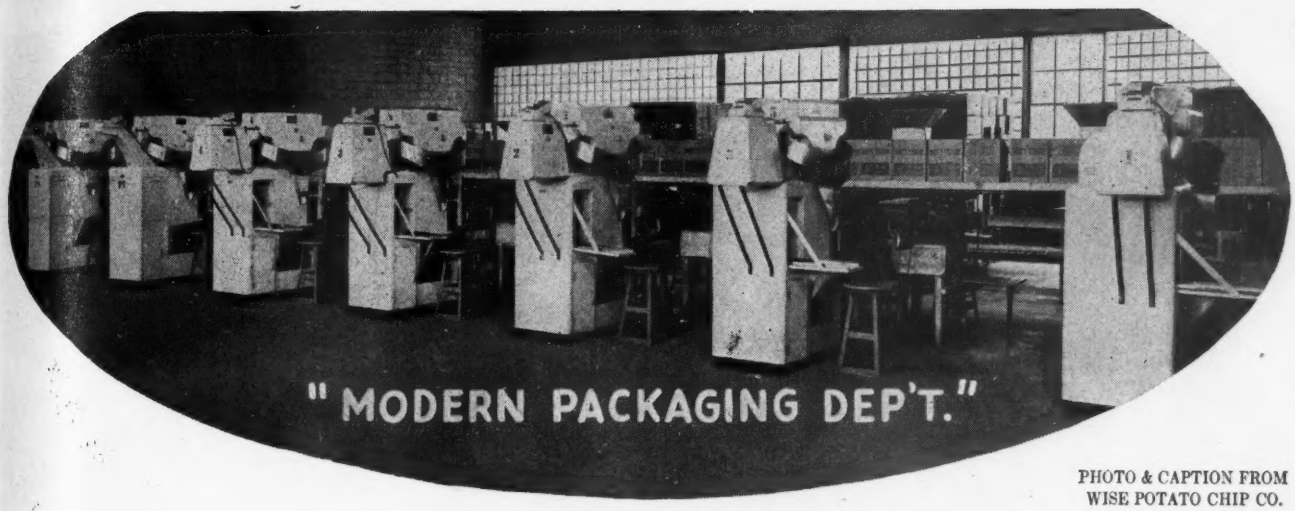
Matthew E. Highlands, Eau Claire, Wis., has been appointed associate food technologist at the Maine Agricultural Experiment Station. He will devote most of his time to research work in developing new products from surplus Maine crops, especially in the fields of canning, freezing and dehydrating. Mr. Highlands has been superintendent of Lange Canning Corp., Eau Claire, Wis.

Robert Charles Hill, former clerk of the Senate Committee on Banking and Currency, has assumed the managership of the Washington office of the National Confectioners' Association. Mr. Hill succeeds Harold O. Smith, Jr., who has become executive vice-president of the United States Wholesale Grocers' Association.

Andrew Kristalyn has been appointed production manager of the Oakland, Calif., Bakery of Sunshine Biscuits, Inc., according to an announcement by Hanford Main, Sunshine's president.

Lt. Irvin E. Liener, having served with the Quartermaster Corps in the European Theater, has been assigned to the rations planning office of the Quartermaster Food and Container Institute, Chicago. He will work on nutritional studies on military rations.

Mark M. Luckens has accepted a position as director of research and development with the Arizona Cooperative Date Producers Association, Chandler, Ariz. In addition, he is opening laboratories and offices for consulting work in food technology, environmental sanitation and industrial hygiene.



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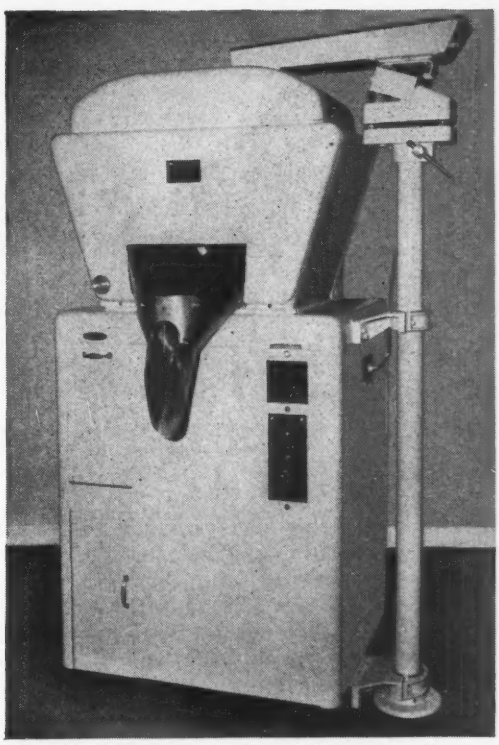
WISE POTATO CHIP CO.

Customers Acclaim New Weigher!

When one of the world's largest makers of one of the most difficult products to package puts his stamp of approval on a new machine, that machine is worth your consideration. Especially when over 70 other users also report satisfactory results. Get the full story now on the Hy-Tra-Lec Automatic Weigher. Developed and manufactured by Wright's Automatic Machinery Company, pioneer since 1893 in automatic packaging machinery and a division of the SPERRY CORPORATION.

Free Flowing Dry Products Accurately Weighed & Filled

Hy-Tra-Lec weighers are available for handling free-flowing dry products in a range of one-half ounce to 16 ounces. Customers say accuracies are maintained with Hy-Tra-Lec superior to those previously attainable at comparative speeds. Mail coupon today for descriptive literature.



Do You Package These Products?

Hard Candies	Walnuts	Potato Chips
Cranberries	Macaroni	French Fries
Corn Chips	Noodles	Dried Beans
Cookies	Spices	Coffee Beans
Crackers	Moth Balls	Nut Meats
Rice	Pretzel Stix	

WRIGHT'S Automatic Machinery Company ★

333 Calvin Street, Durham, North Carolina

Gentlemen:

I am interested in knowing more about your Hy-Tra-Lec weigher.

☐ Send me latest literature.

☐ Ask your nearest office to make an appointment to see me at my plant.

NAME

COMPANY

ADDRESS

Chief Product Packaging Weights

four of a kind . . . all different

Four important members of the *Wyandotte* family of *specialized* compounds are: Wyandotte G.L.X.* . . . Wyandotte S.R.-10 . . . Wyandotte Citrifoam* . . . Wyandotte Steri-Chlor*. All give quick, safe and effective results. Each fills a specific need in modern food plants.

For high-temperature, high-speed pasteurizing systems or for general cleaning of all types of food-processing equipment, Wyandotte G.L.X. is unsurpassed.

Wyandotte S.R.-10, a mild acid-type product in crystalline form, is effective for removing certain kinds of soil and scale deposits from food processing equipment.

Wyandotte Citrifoam gives excellent results with spinach, for example, in a wet tumble-wash . . . with asparagus, for example, in a warm-water soak . . . and as a container rinse or wash when packing in glass.

As a germicidal rinse for *all* equipment, Wyandotte Steri-Chlor insures greater protection and increased sanitary control. It is invaluable, too, as a germicidal rinse for workers' hands.

Let your Wyandotte Representative show you how well these products can work in *your* plant. He's always at your service—and as near as your telephone.

*Registered trade-mark

Wyandotte
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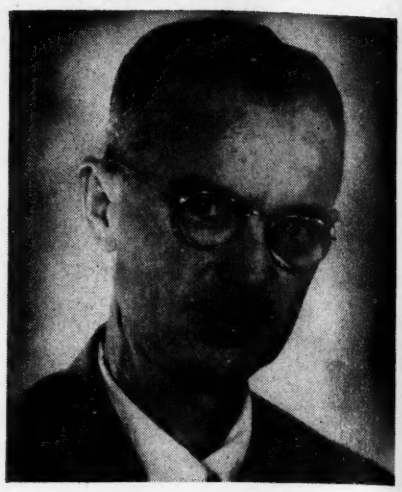
WYANDOTTE CHEMICALS CORPORATION

WYANDOTTE, MICHIGAN • SERVICE REPRESENTATIVES IN 88 CITIES



CHARLES W. CALDWELL

After approximately five years of service with the government, Charles W. Caldwell has returned to industry as general manager of the Drew Corporation of America, Brooklyn, N. Y., manufacturer of vanilla.

Grant C. Marburger, former head of the engineering branch of the Quartermaster Food and Container Institute, Chicago, is now with Rogers Brothers Food Products Co. as engineer in charge of the new dehydration plant at Grand Forks, N. D.

Henry T. Meigs, formerly general manager of Fisher Baking Co., Salt Lake City, Utah, and more recently operator of the sweet goods plant of Langendorf United Bakeries, San Francisco, has joined the bakery division of the American Dry Milk Institute, Inc., to represent the Institute in the western section of the country, with headquarters in Lafayette, Calif.

George V. Robbins has been appointed manager of the green coffee section, Maxwell House Division of General Foods Corp., according to J. K. Evans, the division's general manager.

Allen Saul, Beechnut Packing Corp., Canajoharie, N. Y., is to be manager of the company's new plant at San Jose, Calif.

Lucius M. Tolman, head of the research and development department of Wilson & Co., Chicago, has retired after 31 years with the company.

DEATHS

Samuel Walker Biggar, 84, retired creamery operator, July 20, at Yakima, Wash.

Frank W. Cutler, 65, founder of Cutler Manufacturing Co., and director and vice president of Food Machinery Corp., August 11, at Portland, Ore.

Richard E. Eagan, founder of Bay

THE FROZEN-FOOD INDUSTRY IS FINDING PROFIT—

in this wonderful new container!

This new frozen-food container is a compact unit with a paraffin-impregnated fibreboard body and strong metal ends.

Its simplicity and strength eliminate the use of inner bags and separate liners. It speeds up processing and packaging, gives greater protection to the product.

Tests show that it is preferred by both dealers and consumers. Food processors find that it decidedly reduces processing costs and unit costs on frozen foods.

Research and Know-How

This new container—a product of American Can Company research and technical know-how—is another positive evidence that *those who do business with Canco profit.* For 46 years we have been helping our customers to profit through our creative approach to container problems.

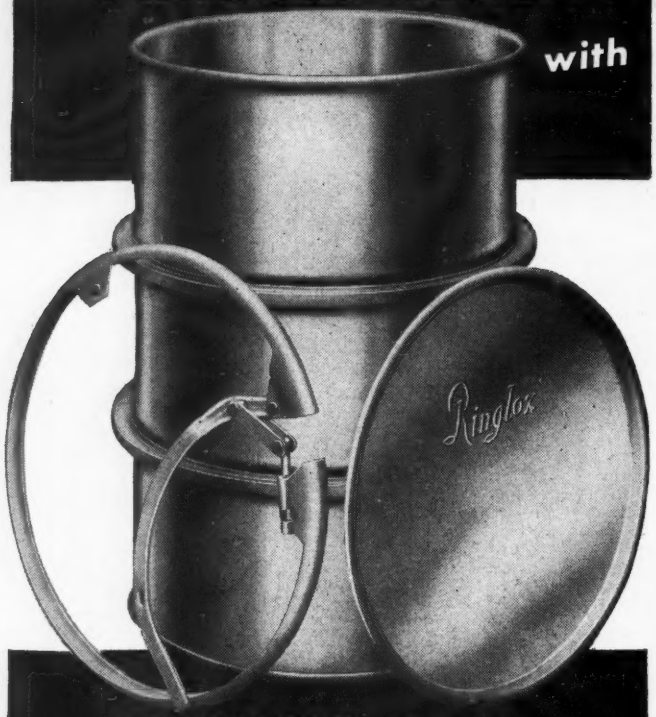
We have never stopped inventing new containers and improving old ones.

These achievements make an impressive record which benefits you and your business. We can help you solve your container problems—to increase *your* business and *your* profit.

AMERICAN CAN COMPANY

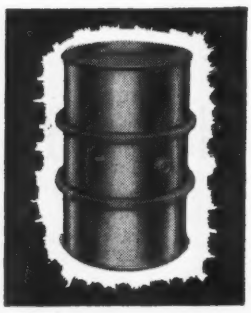
NEW YORK • CHICAGO • SAN FRANCISCO

Safeguard
PRODUCT QUALITY
with



STEVENS Metal
BARRELS AND DRUMS
of ENDURO Stainless Steel

Don't take chances with product contamination. Use barrels and drums of Enduro—the lustrous metal that is inert to most chemical and food products—that is sanitary and easy to clean—that is resistant to corrosion—that is tough and strong—that is economical to use because it lasts so long.



The STEVENS Line offers a type and size for every chemical and food plant need. Write us for literature.

★ ★ ★

The solid head drum at the left and the patented Ringlox drum shown above are but two of the many styles in the complete STEVENS Line.

NILES STEEL PRODUCTS DIVISION
REPUBLIC STEEL CORPORATION
NILES, OHIO

STEVENS
METAL BARRELS AND DRUMS
REPUBLIC STEEL
REG. U.S. PAT. OFF.

State Creamery and Eagan Ice Cream Co., Salem, Mass., August 10, at Los Angeles, Calif.

E. F. Howe, chairman of the board, Fairmont Foods Co., Omaha, Neb., and formerly president and a member of the board, American Butter Institute, October 11, after a brief illness.

Herman R. Huth, 49, production manager, Kraft Foods northern division, recently.

William G. Kaesar, 64, district manager, Pet Milk Co., August 6, in Madison, Wis.

Frank Oscar Kalberg, 83, founder of the Independent Dairy, at Seattle, Wash., July 5.

Mrs. Anna Adams Kehoe, 67, founder and president of the Kehoe Preserving Co., Clay City, Ind., October 9.

William A. Kutsch, 64, vice-president, A. E. Staley Manufacturing Co., August 19, after a long illness.

Alvin M. Loverud, 51, attorney for the Food and Drug Division of the Federal Security Agency, recently, in Washington, D. C.

John E. Sharp, 72, president of Aluminum Seal Co., October 11, at Richmond, Ind.

Cecil Bond Spencer, 53, founder of Spencer Packing Co., August 13, at Portland, Ore.

ASSOCIATED INDUSTRIES

American Coating Mills Division, Owens-Illinois Glass Co., Toledo, Ohio, has purchased the Grand Rapids Paper Box Co., Grand Rapids, Mich., manufacturer of folding cartons and set-up boxes.

Diversey Corp., at its annual board meeting, elected O. E. Soderberg as administrative vice-president and Vance C. Woodcox, vice-president. Mr. Woodcox was president of Enoz Chemical Co., which Diversey purchased in July. Mr. Soderberg has been with the company since 1929 and most recently has served as secretary.

St. Regis Paper Co. (Canada), Ltd., has completed a new $450,000 multiwall paper bag plant at Vancouver, B. C.

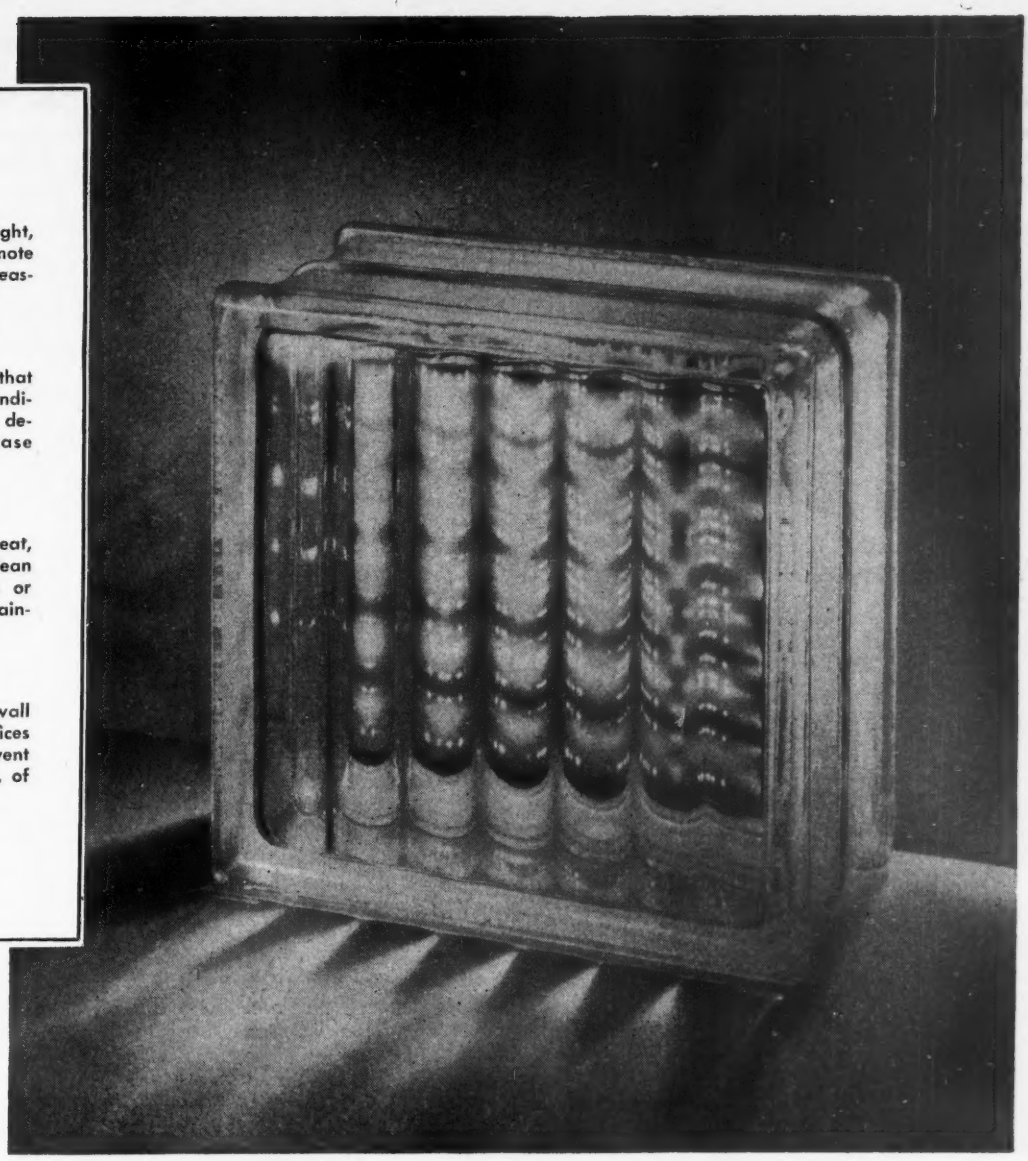
Tri-Clover Machine Co., Kenosha, Wis., has announced the appointment of Richard M. Bode as sales manager for the company. This appointment fills the vacancy created by the recent resignation of George N. Sery.

PC GLASS BLOCKS
provide ample, diffused daylight, which can be directed to remote working areas, thereby increasing usable floor space.

PC GLASS BLOCKS
possess insulating qualities that reduce heating and air-conditioning costs, help maintain desired temperatures, decrease condensation.

PC GLASS BLOCKS
give any food plant a neat, modern appearance. They clean easily, rarely need repairs or replacement, help reduce maintenance costs.

PC GLASS BLOCKS
form a solid, translucent wall which insures privacy for offices and work rooms. They prevent infiltration of chilling drafts, of harmful dust and grit.



One building material gives you all these advantages

● Plant managers who have installed PC Glass Blocks can tell you that they improve the appearance of the plant, set new high standards of efficiency, hold operating costs down to new lows. Whether you are planning for new buildings or for a modernizing program, be sure you have the latest information on PC Glass Blocks. Why not send the coupon today for our recent booklet? No obligation. Pittsburgh Corning Corporation also makes PC Foamglas Insulation.

PC GLASS BLOCKS...the mark of a modern building

PITTSBURGH PC CORNING ® GLASS BLOCKS

Distributed by PITTSBURGH PLATE GLASS COMPANY
by W. P. Fuller & Co. on the Pacific Coast and by Hobbs Glass Ltd. in Canada

FOR ADDITIONAL INFORMATION SEE OUR INSERTS IN SWEET'S CATALOGS

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Room 695, 632 Duquesne Way, Pittsburgh 22, Pa.
Please send along my free copy of your new book on the use of PC Glass Blocks for Industrial Buildings. It is understood that I incur no obligation.

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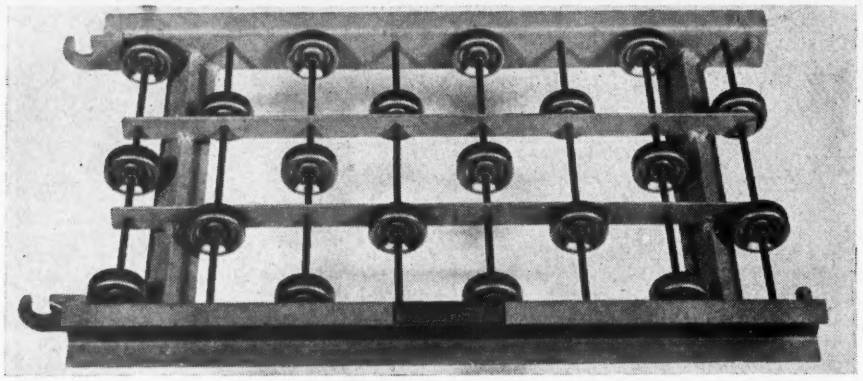
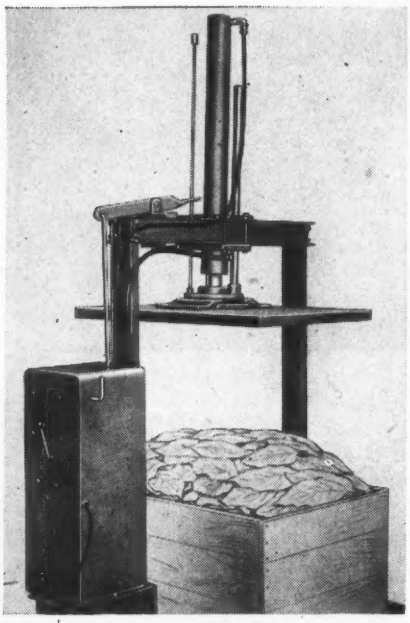
FOOD EQUIPMENT NEWS



Wheel Conveyors Insure Straight-Line Travel 1

To insure straight-line travel for rigid containers, the Sage Equipment Co., Dept. I, Buffalo 13, N. Y., is manufacturing a gravity conveyor line using ball-bearing zinc-plated wheels instead of rollers. Of light-weight, welded steel construction, the 5- and 10-ft. sections can be easily handled by one man. Made in 12-, 14- and 18-in. widths, with convenient hooks for assembly into conveyors of required lengths.



Hydraulic Packing Press 2

A HYDRAULICALLY operated packing press, developed to press bulky materials into packing cases so that the top can be fastened down, is offered by Lyon-Raymond Corp., Dept. I, Greene, N. Y. It consists of a hydraulic cylinder and motor-operated pumping unit to be installed on a channel framework. The hydraulic cylinder is a double-acting type; both the extension and return strokes are power operated. The pumping unit consists of a ¾ hp. motor, gear type hydraulic pump, relief valve to prevent overloading, lever controls and self-contained oil reservoir. Hose connections between power unit and cylinder are flexible to allow easy installation.

Spiral Conveyor Cover 3

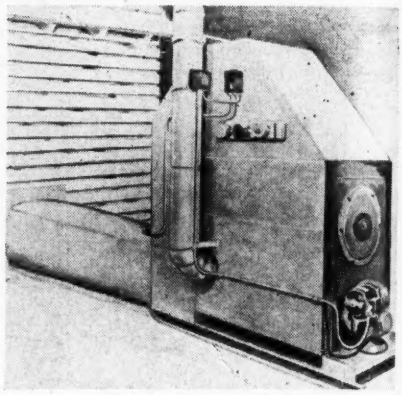
A NEW design of cover and T-head bolt for spiral conveyors is announced by the Jeffrey Mfg. Co., Dept. I, Columbus, Ohio. The cover is flanged, providing a smooth rounded edge and adding stiffness which permits the use of fewer bolts than heretofore. Slotted holes in the cover permit it to pass over the T-head bolts without removing them. By simply giving a quarter turn to these spring-mounted bolts the cover is locked securely. It may be easily removed by reversing the procedure.

Aluminum Bottle Case 4

AN all-aluminum milk bottle case of heavy-duty construction, which weighs less than 6 lb., is sold by the Creamery Package Mfg. Co., Dept. I, Chicago 7, Ill. Top and bottom reinforcement are of extra strength, heat-treated aluminum extrusions. All separate parts are permanently riveted and spot welded together. Exclusive bottle separators, of 0.051 gage aluminum alloy, prevent bottles from touching each other.

Nylon Filter Cloth 5

NYLON filter cloth having exceptionally high abrasion resistance, excellent heat resistance, unaffected by fungi and microorganisms, with an extremely smooth surface which greatly facilitates cake discharge, is now available from Filter Media Corp., Dept. I, Hamden 14, Conn. It is produced in twill, chain and plain weaves, in numerous porosities, and in widths from 26 to 72 in. It can also be supplied in the form of made-up filter element covers, with all sewing done with nylon thread.



Portable Oil Fired Drier 6

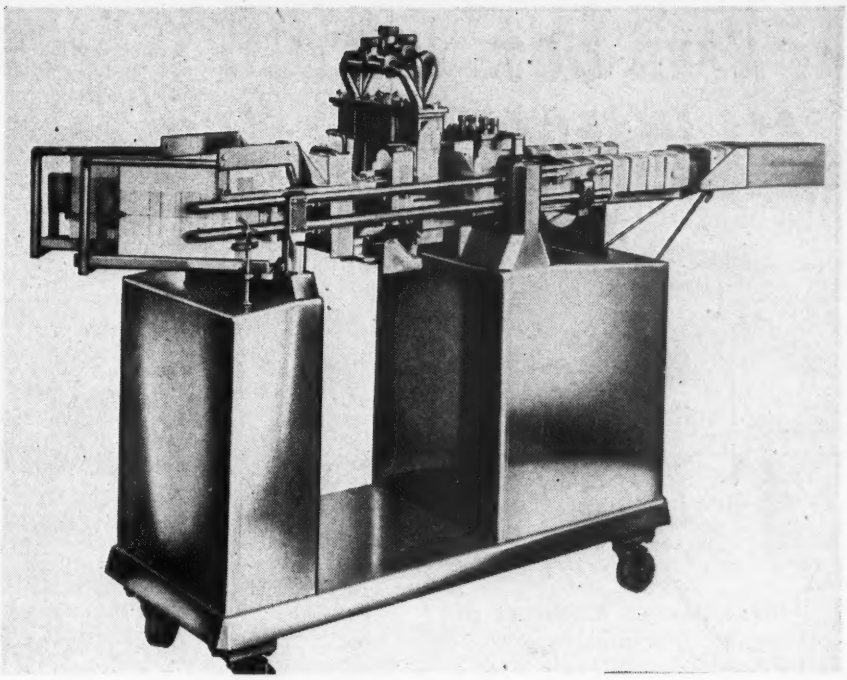
THE PoweRated Mobile Corn Drier, which dries up to 1,000 bu. of cribbed corn in approximately 4 days under favorable conditions, is now being marketed by Jackson & Church Co., Dept. I, Saginaw, Mich. Unit has an output of 460,000 Btu.'s per hr. and a fan capable of delivering 6,500 cfm. of air at 120 deg. F. against a pressure of ½-in. Fan delivers 5,500 cfm. at a pressure of 1½-in. which allows equipment to be used for drying hay, beans and small grains. Combustion chamber of stainless steel resists corrosive fumes and gases and adds to ability of unit to withstand shock during movement. An atomizing pressure type oil burner is used which can conveniently be attached to standard 55-gal. drums. Equipment is obtainable for tractor or electric motor operations, skid or trailer mounted.

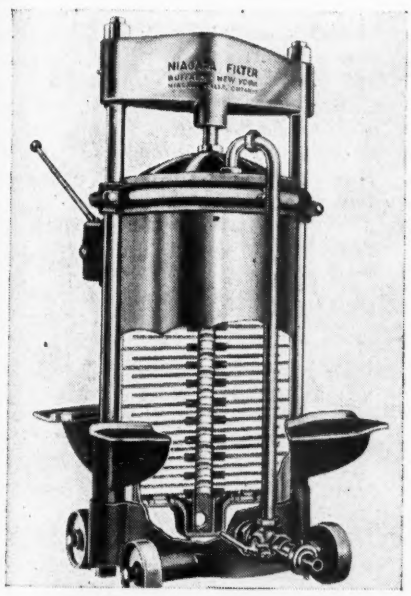
WRITE FOR MORE INFORMATION

Food Industries Reader Service now makes it easy for you to follow up the news on new equipment and new materials. Tear-out coupon cards are supplied for your convenience on the special colored page which follows the equipment news section in this month's issue. Enter your requests, fill out and mail cards, and let Reader Service do the rest.

Belt Cutter 7

A NEW type of belt cutter for belts up to 60 in. wide and 1⅛ in. thick has been developed by the Flexible Steel Lacing Co., Dept. I, Chicago 44, Ill. It is made of two elements; the head that carries the blade and a T-shaped base or guide rail. All that is necessary to do to use the cutter is to square the base up with the center line of the belt. The base is then nailed to the belt and the cutter is pushed across the belt. Each cut is made about ⅛ in. deep and the screw is then turned to lower the blade another ⅛-in. With several rapid cuts a belt can be cleanly and squarely cut. The blade consists of a long, thin, narrow strip of steel sharpened in a V shape. It is held in a vertical position in the head and vertical adjustment is accomplished by means of a screw. The base is made in four lengths for 24, 36, 48 and 60 in. belts. Each base is 4 in. longer than the width of the belt on which it is designed to operate.





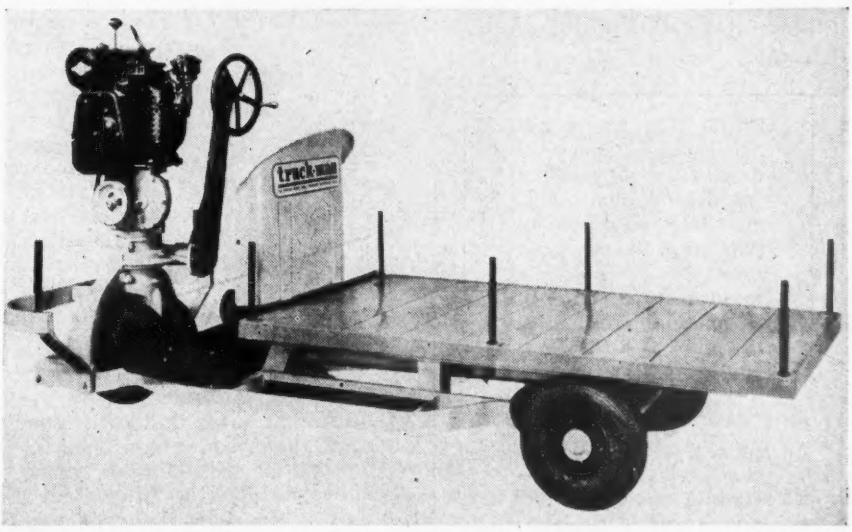
Pulp Filters, Washers 8

A NEW line of pulp filters and pulp washers for the brewing industry is announced by Niagara Filter Corp., Dept. I, Buffalo, N. Y. The pulp filters feature stainless steel shells and screens, nickel alloy cocks and fitting and a new streamlined design. Greater sanitation is obtained by a stainless steel cover facing and by the use of this material at all beer contact points. The handwheel on the top of the filter has been replaced by a hydraulic cover-lift. More perfect filtration is assured by an automatic cell lock that prevents misalignment of pulp layers. Features of the washer are: Exclusive roll action which results in faster working with no danger of balling the pulp; welded tank eliminating gaskets; lowered power requirement, and improved pumping system to provide faster circulation at slow speeds.

Package Machines for Pint Ice Cream Cartons 9

A NEW automatic machine for setting up, filling with 1, 2 or 3 flavors of ice cream, and closing the top of pint cartons at a rate up to 3,600 per hr., is announced by Anderson Bros. Mfg. Co., Dept. I, Rockford, Ill. Positive mechanical fingers pick up the flat carton from the magazine and advance it through the squaring and bottom closing device. It is then elevated so that the filling nozzle extends to the bottom of the package. As it is filled, the carton is pushed down by the pressure of the ice cream until it hits an electrical interlock switch which engages a clutch to push the package forward to start a new cycle. After being filled, the package is advanced to the top closing device and then to the bagging table. Bypass valves located at the freezers are operated by pushbutton control on the machine. If it is shut down during operation, the ice cream is automatically bypassed at each freezer to keep the flavors separate. The machine will take the full capacity of three 150-gal. continuous freezers or a total of 450 gal. per hr.

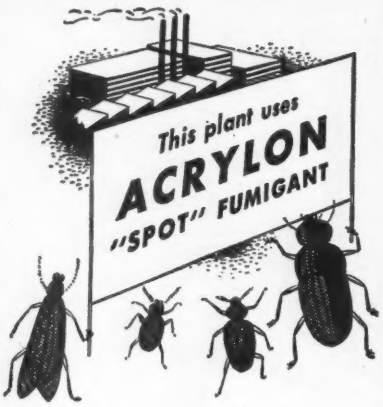
Speed of fill is determined by the amount of ice cream coming from the freezers. Each package is filled to the proper height before the next one is advanced to the filling nozzle.



Platform Utility Truck for Odd-Jobs 10

A PLATFORM utility truck, designed for solution of odd-jobs problems in material handling, has been introduced by Truck-Man Inc., Dept. I, Jackson, Mich. The platform is 5 x 5½ ft. and has a capacity of 1,500 lb. It has full high and low speed in forward or reverse. Power is a Briggs & Stratton 2¼ hp. gasoline engine. Specifications are: overall length 108 in.; wheelbase 72 in.; ground clearance 5½ in.; loading height 16 in.; tires, 4, 6-ply pneumatic, size 14 x 4½ in.

KEEP OUT ALL INSECTS!



Infestation of machines in bakeries, flour mills, and similar food-processing plants has always been a serious and difficult problem.

ACRYLON,* the potent new "spot" fumigant, now provides a quick and effective answer. A few ounces poured in a machine rid it of insects with relatively short exposure. ACRYLON vaporizes completely, leaving no residue. It presents no fire hazard, and does not adversely affect food products in any way.

ACRYLON is economical. Fluid-ounce graduations on the quart-size bottle assure accurate measuring, no waste. Also available in 10-gallon and 50-gallon drums. *Reg. U. S. Pat. Off.

LIQUID HCN for general, building-wide clean-up, and ACRYLON, for periodical "spot" fumigation, are the perfect combination to assure you of thorough, constant control of insect and rodent pests in your plant. Complete information on request.

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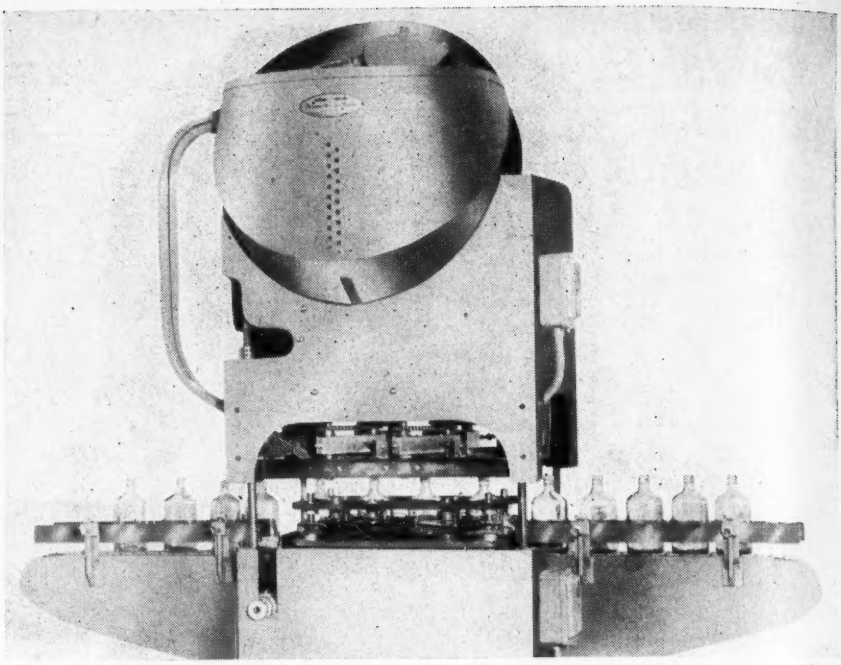
30-X Rockefeller Plaza • New York 20, N. Y.

BRANCH OFFICES • Brewster, Florida
628 Dwight Building, Kansas City, 6, Mo.
2203 First Avenue, South, Seattle 4, Wash.
1207 Donaghey Building, Little Rock, Ark.
235 Montgomery St., San Francisco 4, Calif.
Azusa, California

Keep your plant insect-free at all times with LIQUID HCN and ACRYLON



Automatic Straight Line Screw Capper 11

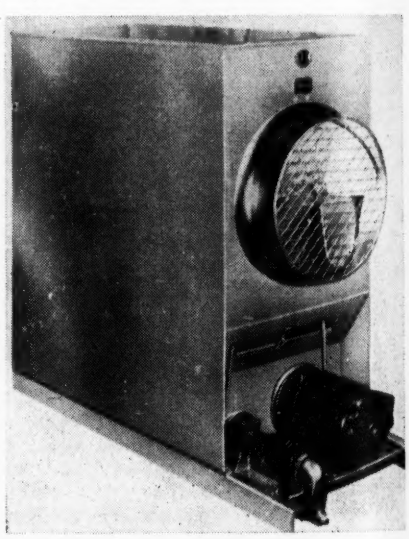
POMONA MACHINE WORKS, Dept. I, Pomona, Calif., is producing an automatic straight line capper with a capacity of 150 containers per min. Caps from a large hopper are mechanically positioned into the cap feeding line at a rate automatically controlled by the rate of use. The conveyor of the machine is adjusted to conform with line speed. As each bottle enters the capper, it is positioned and held by rubber belts moving at line speed, while the cap is screwed down and tightened. Capping is accomplished with no shock to the bottles, no stopping, change of direction or splashing, no high speed mechanism. Quick changeover and adaptability to uneven rates of production make the machine economical for small plant operation as well as large.

Non-Corrosive Finish 12

P-5, a new anti-corrosive, fast drying, copolymer finish for the protection of metal, wood and concrete against corrosion from exposure to moisture, acids, alkalies and many other disintegrating elements has been developed by The Watson-Standard Co., Dept. I, Pittsburgh 12, Pa. It is free from objectionable paint odors, is non-toxic and dries by evaporation without requiring an oxidation period. It has good thermal stability, is highly resistant to abrasion and scrubbing and has good aging characteristics. Available in 9 colors.

Versatile Dry Filler 13

THE "Fillmaster," a new package filling machine that will handle a wide variety of products of a free-flowing or slow-flowing nature, is announced by the Stuyvesant Engineering Co., Dept. I, Lyndhurst, N. J. Special features of the machine are: Any filling speed between 15 and 120 per min.; three different filling ranges—a fraction of a gram to 6 oz.; 3 oz. to 3 lb.; 8 oz. to 5 lb.—obtained by use of interchangeable parts; accurate net weight; fills any type container; inexpensive, noiseless and safe.



Compact Cooling Tower 14

A NEW compact cooling tower for indoor or outdoor service, with a high performance rating, sized from 3 to 15 tons of refrigeration, is offered by The Marley Co., Inc., Dept. I, Kansas City 15, Kan. Completely assembled at the factory, using standard components with a heavy steel welded case painted aluminum, the unit is available with or without pumps. All component parts accessible.

NOW AVAILABLE FROM WAREHOUSE STOCKS . . . *in the forms and sizes you need*

"MONEL"

SHEET • TUBING • STRIP • BAR • ROD
PLATE • WIRE AND WIRE CLOTH

For durable, corrosion-resistant equipment, insist upon Monel

Today, you can enjoy all the advantages of Monel* . . . in all kinds of plant equipment. For Monel is available *in quantity* . . . in the forms you need.

You can get sheet Monel for tables and work surfaces . . . for tanks, trays, hoppers and chutes. Or seamless Monel tubing for heating coils . . . Monel rod, bar, strip, wire and wire cloth for a variety of other uses.

You probably know Monel's resistance to corrosion. You may also know how this strong, solid metal withstands hard knocks and constant use.

Health officials, too, give Monel their okay. This rustproof Nickel Alloy doesn't affect the purity, color or flavor of food products. Its smooth, lustrous surfaces are clean and sanitary.

When you need new plant equipment or utensils, it is sound economy to have them made of Monel. And remember, when you need to make repairs, Monel is easy to work with. And we've a lot of helpful information available that tells you how. The bulletin mentioned below, for example. It's free. Why not let us send you a copy now?

Just mail the coupon.

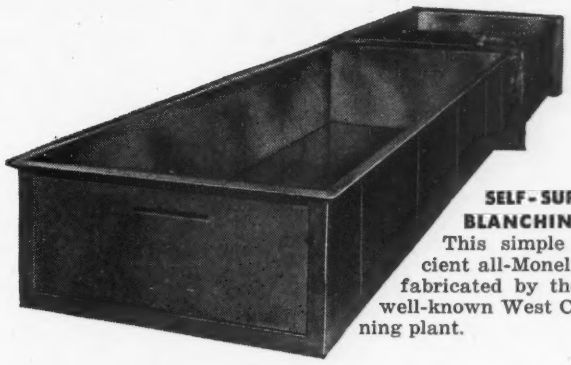
PROMPT DELIVERY ASSURED
There's an INCO Distributor near you!

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.

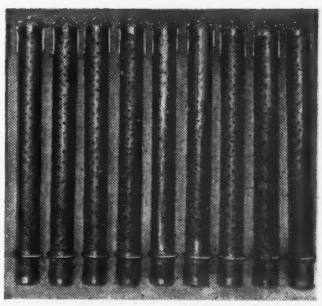
NICKEL (INCO TRADE MARK) **ALLOYS**

MONEL* • "K"* MONEL • "S"* MONEL • "R"* MONEL • "KR"* MONEL • INCONEL* NICKEL • "Z"* NICKEL • "L"* NICKEL

*Reg. U. S. Pat. Off.

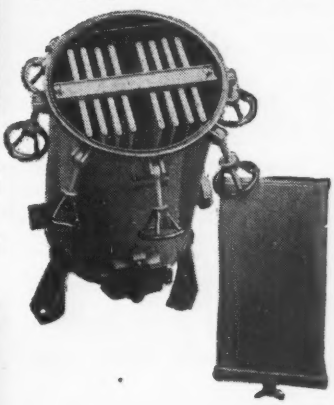


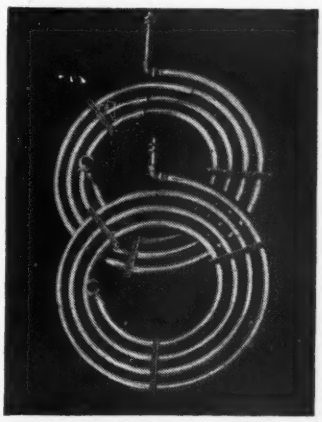
SELF-SUPPORTING BLANCHING TANK. This simple and efficient all-Monel unit was fabricated by the user, a well-known West Coast canning plant.



STRAINERS FOR TOMATO SCALDING TANKS. These are made from perforated Monel sheet, and fitted with Monel handles and flanges. They're strong, tough and trouble-free.

OIL FILTER PRESS. Screens are made of Monel wire cloth. They are rustproof and corrosion resistant. Stand up under high pressure and hard use.





MONEL HEATING AND COOLING COILS prevent harmful metallic contamination and discoloration. Monel is readily fabricated by ordinary methods.

SEND FOR FREE BULLETIN!

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.

Repairing our own corrosion-resistant equipment sounds like a good idea. Please rush my copy of your free bulletin T-2, "WELDING, BRAZING AND SOFT-SOLDERING OF MONEL."

Name.....

Company.....*Title*.....

Address.....

City.....*Zone*.....*State*.....

F.I.12-47

A BETTER Strainer to "police your pipelines"

• FIRST—*The Screen*, a high-grade woven Monel wire basket that catches solids—lets condensate, oil or other fluids flow freely.

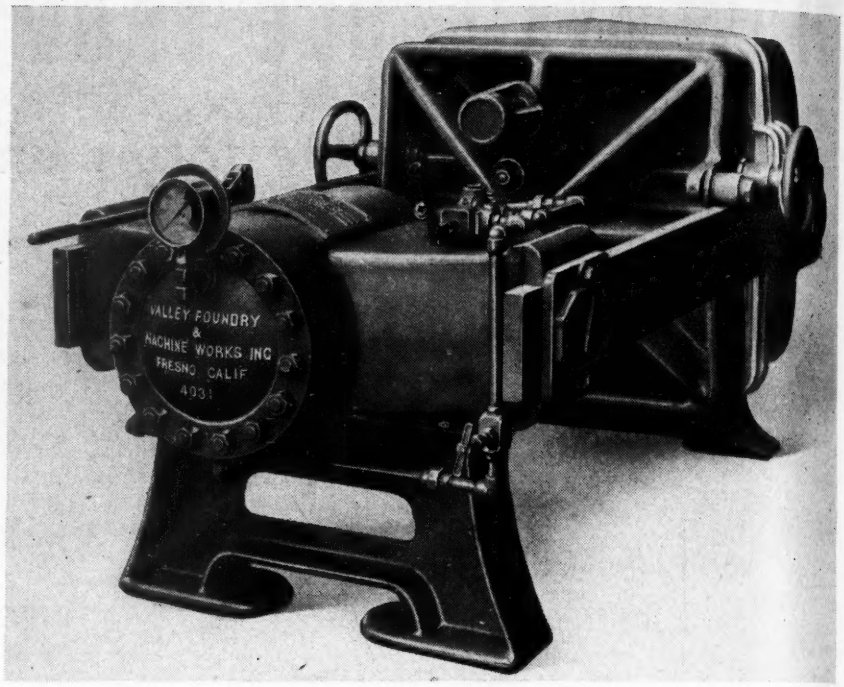
• SECOND — *Finish*. Cadmium plated for protection against corrosion and for better appearance.

• THIRD—*Easily Cleaned*. Blow-off bushing made for easy removal. Bushing and Screen come out together. Screen automatically aligns on reassembly.

• THOUSANDS IN SERVICE — Sold by nearly 150 Mill Supply Houses.

6 sizes from ½" to 2" for pressures up to 600 lb. Reasonably priced. See your supply house or write for Bulletin S-201.

YARNALL-WARING CO.
127 Mermaid Ave., Phila. 18, Pa.



Hydraulic Device Closes Large Filter Press 15

A STREAMLINED hydraulic closing device, for installation on large model filter presses used in the processing of wine, beverages and food products, has been perfected by Valley Foundry & Machine Works Inc., Dept. I, Fresno, Calif. The new design eliminates the conventional gear and ratchet device and prevents excessive drip, while closing large filter presses with a minimum of effort. Plates and frames are pressed together tightly by hydraulic pressure to form a compact filtering unit. A steel piston, with special hydraulic cups, operates the ram within a 2-way acting cylinder. A 3-way, slide-action, lever-operated valve forces the hydraulic flood to each end of the cylinder. One stroke of the lever diverts the hydraulic flood on the opposite side of the piston and retracts the ram to open the filter press. Operation is effective with soluble oil, water solution, hydraulic fluid or light cylinder oil. A special gage indicates ton pressure achieved in closing.

Time Cycle Controller 16

A NEW multiple-cam time cycle controller for use on plant processes where a number of factors, such as the opening and closing of valves, switches, dampers, retorts and presses; and the starting, stopping, or reversing of motor-driven pumps and blowers, must be accurately timed according to a fixed program, is announced by the Bristol Co., Dept. I, Waterbury 91, Conn. In operation it actuates or engages, at exactly the correct time in each cycle, the necessary electrical or pneumatic devices for automatically carrying out the intended schedule. Time measurements and pilot valve operation are handled by separate mechanisms. Timing is accomplished by a Telechron-driven aluminum disk on which is printed a 25-in. time scale. The desired schedule of operations is incorporated into the controller by cutting notches with a notching punch on the time scale. The location of these notches determines the time of operation of the cam mechanism. Disks for new cycles or schedules of operation can be easily made.

Dew Point Meter 17

THE Alnor Dewpointer, a new precision-built instrument for dew point measurement that makes it easy for two or more observers to get the same results, is announced by Illinois Testing Laboratories, Inc., Dept. I, Chicago 10, Ill. It eliminates the need for external coolants: Further, the dew or fog is observed suspended in air—not on a polished surface. Readings are accurate and are taken in a matter of seconds after only a short period of practice. Available in two ranges: For dew point between 20 deg. F. and room temperature and from — 100 deg. F. to 0 deg. F.

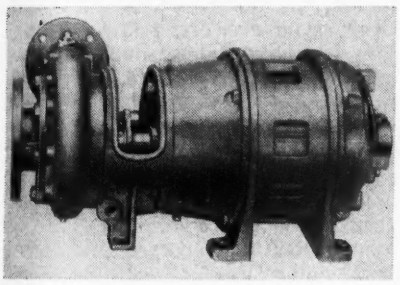
Small Space Fumigator 18

A SMALL space fumigation applicator, which punctures from 1 to 12 1-lb. cans of methyl bromide simultaneously, has been placed on the market by J. Carl Dawson, Dept. I, St. Louis 21, Mo. With the applicator enough methyl bromide is available at one time to fumigate the average railway box car, cold storage vault, truck trailer, or river barge section. It can

also be used for under tarpaulin fumigations and in combination with additional applicators for large space fumigation. The applicator works simply and safely: Cans of methyl bromide are placed on a rack, held down by a locking clamp bar. After release of a safety catch, one steps down on a lever, which causes the cans to be punctured and the holes immediately gasketed so that the gas flows from the cans into connected tubing and through a Saran plastic tube into the space to be fumigated. If less than twelve cans are used, automatic shut-off valves operate at the unused puncturing points to keep the gas from escaping. A valve at the junction of the applicator and the tubing can be used to control the total flow of gas.

Close Coupled Pumps 19

GOULDS PUMPS, INC., Dept. I, Seneca Falls, N. Y., announces a new line of "Close-Cupld" centrifugal pumps available in 17 sizes, with capacities up to 2,000 g.p.m., and heads up to

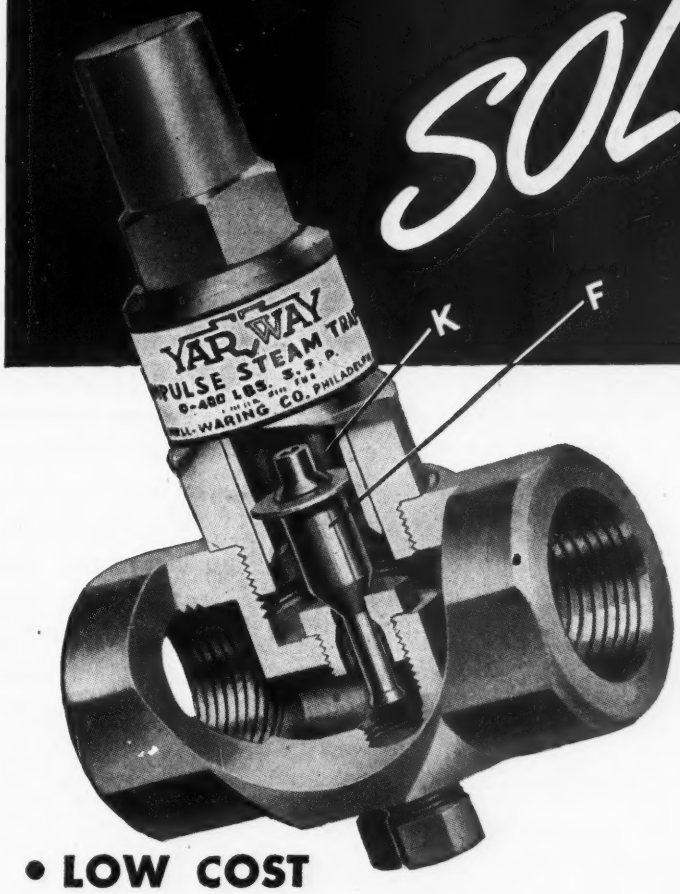


400 ft. Pump and motor are combined on a single compact assembly ready to install and operate in any position, except vertically with motor below pump. A single shaft eliminates a coupling to assure perfect and maintained alignment with freedom from vibration. One of the new features is a machined stuffing box which permits the use of either a die-formed, semi-metallic packing with lantern type liquid seal ring, or a mechanical seal. A full-length shaft sleeve protects the main motor and pump shaft against liquid damage. When necessary, sleeve can be removed easily. Provision is made for expansion and contraction of the sleeve to prevent buckling and distortion. The liquid deflector is drilled and tapped so that in servicing pump a spanner can be used to prevent shaft rotation while tightening or removing impellers.

Heat Sealer 20

A NEW low-cost Roto-Seal-It machine in which each bag is carried through four pressure points simultaneously, where heat is applied, thus eliminating pre-heating has been perfected by the Heat Seal-It Co., Dept. I, Philadelphia, Pa. This results in early doubling production and in providing an extra strong seal at the same time. A rotary sealer supports the bag in the normal, natural way at

OVER 550,000 SOLD



- LOW COST
- SMALL SIZE
- LIGHT WEIGHT
- QUICKER HEATING
- ONE MOVING PART

HOW THE YARWAY IMPULSE STEAM TRAP WORKS. Condensate by-passes continuously through Control Chamber K. This discharge through center orifice reduces chamber pressure and valve F lifts for full flow through main seat. At near-steam temperature, condensate vaporizes in control chamber, expands and closes valve.

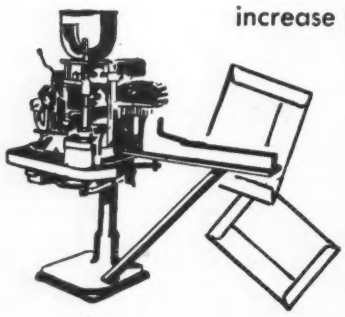
Sold by nearly 150 Mill Supply Distributors throughout the U.S.A. See your supply house or write for Catalog T-1739.

YARNALL-WARING COMPANY
127 Mermaid Avenue, Philadelphia 18, Pa.

YARWAY IMPULSE STEAM TRAP

SMALL IN SIZE *But* Mighty as Sales Builders

Eye-catching Brown Bag packets, filled with food products in powder, granular, crystal, or any dry free-flowing form are small in size but mighty as sales-builders. In countless outlets, on tables, racks, cards and counters — places where your product isn't carried in full size packages — Brown packets sell on sight and open up untouched markets to increase your sales and profits. Brown packets also protect your products to keep them fresh. With Brown Bag filling equipment, you can fill them quickly and uniformly with a minimum of loss. Prove to yourself that Brown Packeting pays handsome sales dividends. Let us fill a sample order of your product.



Packeting Now?

ORDER YOUR ENVELOPES FROM *Brown*

Colorful, open-end envelopes, made to your own specifications, have eye-appeal and buy-appeal that keep your product out front. Brown Bag serves as packet headquarters for many of the nation's largest food industries.

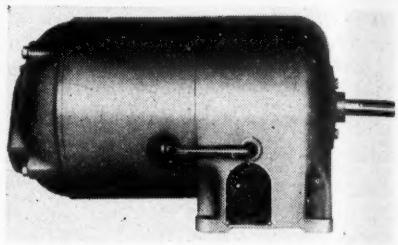
BROWN BAG FILLING MACHINE CO., INC.
FITCHBURG, MASSACHUSETTS

West Coast Reps., Peter D. Bowley & Assoc., 369 Fifth St., San Francisco, Cal.

the bottom, while it travels through the sealer without the use of belts, chains or other complicated devices. Because of this there is less wear and tear on the bag, feeding is made easier and more rapid and the possibility of mechanical mis-alignment is eliminated.

4-Speed Gearshift Drive 21

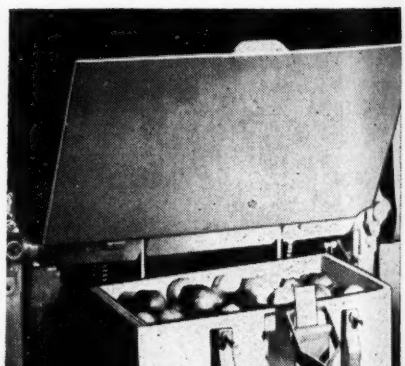
THE Lima Electric Motor Co., Dept. I, Lima, Ohio, announces the 4-speed, Type R, Lima Gearshift Drive, with integrally mounted single phase motor. Units are built to drive machin-



ery requiring selective speeds and are available in sizes of ½ hp. at 1,200 rpm. and ¾ hp. at 1,800 rpm. Gear ratios are 1:1, 1.33:1, 2:1, and 4:1. The single phase unit will operate on 115 and 230 v. a.c.

Fruit Box Dumper 22

APPLES are dumped, with less chance of bruising and stem puncture, by an electrically controlled and fully automatic field box dumper now in production by Food Machinery Corp., Dept. I, Riverside, Calif. The loaded field box is taken by belt conveyor into a jig. There it is automatically positioned and its sides are grasped by metal arms. A sponge rubber



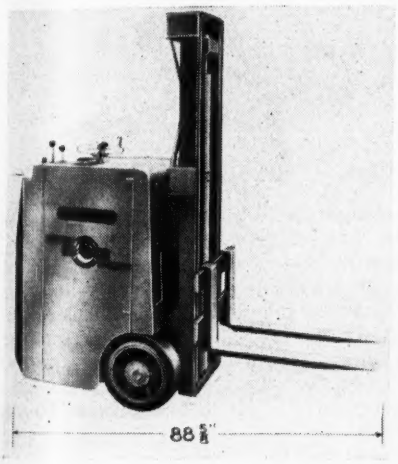
covered lid swings down and clamps firmly over the top of the box. The loaded box is then picked up and turned over; the cushioned lid opens slowly to let the fruit roll out gently on to the grading belt. The boxes are dumped uniformly so that the flow of apples is controlled.

Grease Trap 23

A NEW type of grease interceptor, which incorporates for the first time the principle of filtration of grease by grease, together with conventional gravity separation, is made by the Wade Mfg. Co., Dept. I, Elgin, Ill. It consists of a cast iron body, baffle, tubes and cover. The body is tapped for inlet, outlet, gas and air vents. The T-shaped baffle channel is cast in one piece and is readily removable for cleaning. The tubes are of steel and are upset and pressed through the channel. Made in sizes with 10, 15, 20, 25, 35 and 50 g.p.m. waste flow capacities. Larger sizes can be built to user's requirements.

Operates in 8-ft. Aisles 24

A NEW electric fork-lift truck designed especially for warehouses and plants with narrow aisle space has been announced by Crescent Truck Co., Dept. I, Lebanon, Pa. It can stack 42x32 in. pallet loads at a right-angle in 8-ft. aisles. One man lifts, hauls and tiers from standing position. All control levers are at his



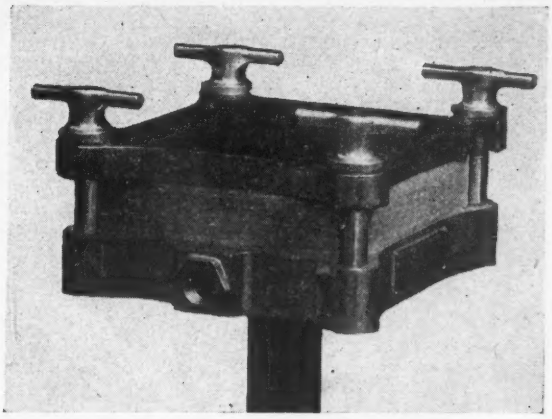
fingertips. Capacity is 2,000 lb. with 36 in. length of load; 1,750 lb. with 42 in. length of load. Other features include fume-free operation; full magnetic contactor control. Hydraulic lift assures minimum maintenance and downtime. Inspection and maintenance is simplified by ready access to all mechanisms.

Gravity Conveyor 25

A NEW lightweight aluminum gravity wheel-type conveyor for general use is announced by the Rapids-Standard Co., Inc., Dept. I, Grand Rapids, Mich. Made in 5, 6, 8 and 10 ft. lengths in one width of 12 in., an 8-ft. section weighs only 31½ lb. Standard self-locking Rapid-Flexible hook and bar couplers permit ready coupling of the new conveyor with other Rapids-Standard material handling equipment. No tools are necessary to set up a series of sections for operation. The frame channel, of formed aluminum, is 2½ in. deep, fabricated from ⅛x4 in. strip. Spe-

Polish the Water that goes into your products.

TRY THE NEW TERRISS NICKEL ALLOY RAPID-FLO FILTER right in your own plant

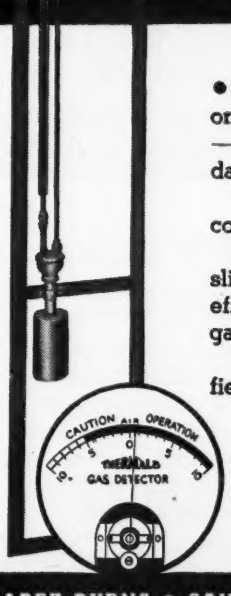


Immediate Delivery

See for yourself the kind of job this filter will do in producing clear, sparkling water! From 200 to 1000 gallons per hour . . . for larger flows filters may be hooked up in series. Rustproof; floor space 1'6" x 1'6". Cartridge filter medium is a laminated block about 1½" thick through which at spaced intervals 20 layers of Rapid-Flo long-fibred cottons are stretched. Cartridges give minimum of 20,000 gallons of water when sand and other type filters are used before the polishing Rapid-Flo . . . some processors secure 40,000 gallons before replacing cartridge.

CONSOLIDATED
SIPHON SUPPLY CO., INC.
Dept. F, 22-24 Wooster St. New York 13, N. Y.

BURNS THERMALO
GAS DETECTOR
Guards Your **GAS-FIRED PROCESSING EQUIPMENT** . . . . . *day and night!*



• This new instrument detects unburned gas, from leaks or incomplete combustion—indicates the concentration —and operates an automatic gas shut-off well before the danger point is reached.

It operates during idle periods as well as through the combustion cycle . . . 24 hours a day.

So sensitive is the detector that its dial indicates even slight deviations from the correct fuel mixture. Equally effective for mixtures of flammable gases with inert gases—and for air-gas atmospheres.

The Thermalo Gas Detector is furnished for any specified type of gas fuel: manufactured, natural or bottled gas.

★ ELECTRICAL
★ NO GLOWING FILAMENTS
★ CONTINUOUS GAS SAMPLING

Write us your problem

JABEZ BURNS & SONS, INC., 11th Ave. at 43rd St., New York 18, N. Y.
Industrial Engineers Since 1864

FLEXIBLE STEEL CONVEYOR BELTING

Regardless of whether your process is Canning, Freezing, Dehydrating, or Pickling or you pack in tin, glass, cellophane, fiber, paper or wood, or ship wood or fiberboard, La Porte Conveyor Belting will save you time and labor and minimize spoilage. There are no sharp edges to injure workers . . . no fabric to harbor germs . . . and its rugged flexible construction withstands impacts at the loading chute. In addition, it will not creep, weave nor jump on pulley stand.

The open mesh feature permits the circulation of air, steam and heat around products in process and facilitates cleaning with steam gun or scalding water. Heat, cold and acid resistant.

Ask your Supplier Today. Available in any length and practically any width.

LA PORTE MAT & MFG. CO.
BOX 124 LA PORTE, INDIANA

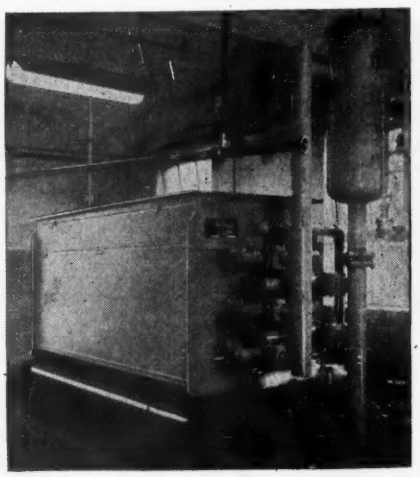
NIAGARA LIQUID COOLER Gives High Capacity in Small Space

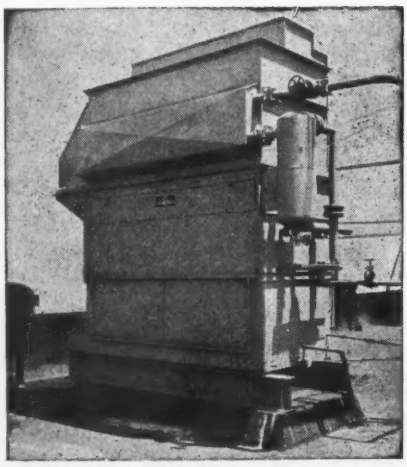
Cold water, chilled to 33° F., or cold liquids, or non-freezing solutions below 32° F. are produced economically by the new Niagara Liquid Cooler.

For large capacity equipment it is most compact. For example, one model furnishes 92 G. P. M. of water cooled from 45° F. to 35° F., with 28° F. refrigerant, in less than 30 sq. ft. of floor space. Other models . . . 24 to 465 G. P. M.

Extra advantages positive temperature control; assurance of holding temperature accurately in spite of variation in cooling load; rapid chilling of liquid; savings in power and refrigeration.

Write for Bulletin No. 100-FI.





NIAGARA Aeropass CONDENSER

. . . increases plant capacity for refrigeration users, saves power, saves condenser water. "Duo-Pass" (patented) reduces condensing temperature, prevents scaling and clogging of condenser tubes. "Oilout" (patented) removes oil and dirt from refrigerant, assuring full capacity.

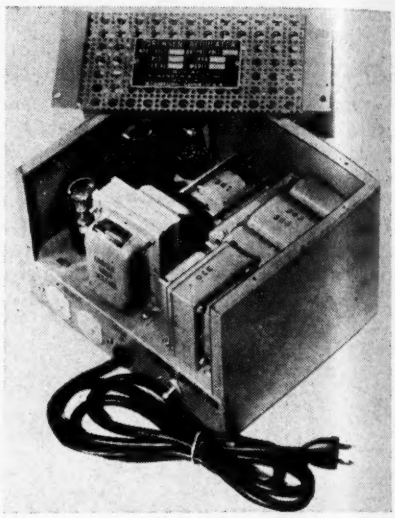
Write for Bulletins 91-FI and 103-FI

NIAGARA BLOWER COMPANY
"30 Years of Service in Industrial Air Engineering"
405 Lexington Ave., New York 17, N. Y.
Field Engineering Offices in Principal Cities

cially designed, wide-faced aluminum wheels are used to further reduce weight and keep free-running action at all times. This weight reduction makes less pitch necessary to provide easy movement of packages.

Voltage Regulator 26

A LOW cost, general purpose a.c. voltage regulator, featuring electronic control circuits and designed specifically for component applications with electrical equipment utilizing light loads, has been announced by Sorensen & Co., Inc., Dept. I, Stamford, Conn. It has an input



voltage range of 95 to 125 volts with an output of 115 volts. Regulation accuracy is ½ of 1 percent and maximum harmonic distortion is 5 percent. Other features include a load range of 10 to 100 percent, a frequency range of from 50 to 60 cycles and a power factor range of 70 percent lagging to 90 percent leading. Maximum recovery time is 6 cycles.

Germ-Killing Light 27

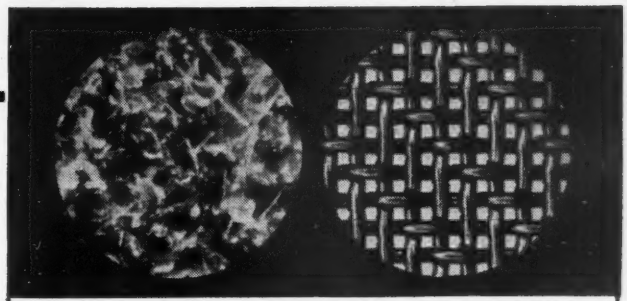
GERMICIDAL units, designed for either direct irradiation or indirect room air disinfection, are made by Lustra Corp. of America, Dept. I, New York 10, N. Y. They may be hung anywhere for temporary or permanent installation, are chromium plated with satin aluminum reflecting surface, and come completely wired and equipped with a 15-watt germicidal ultraviolet tube, 10-ft. cord and plug, toggle switch, starter and necessary ballast for 110-125 v., 60 cycles a.c.

Truck Cooling Unit 28

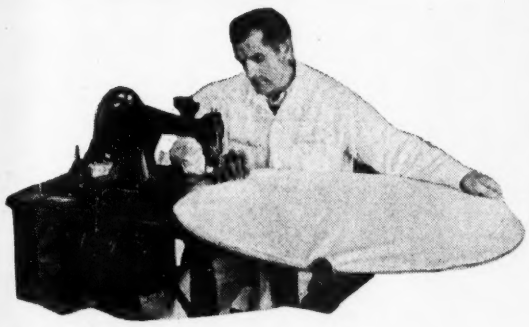
PRODUCTION of a new model refrigerating unit for truck and trailers, where temperatures from zero to 20 deg. below are needed, is announced by The Transport Cooler Co., Dept. I, Farmington, Mich. The cooler consists of two easily installed package units: An enclosed power unit 4x2x2 ft., which is light in weight and may be mounted over the cab or under the

Celite* means longer life for filter cloths because

THE CAKE not the cloth DOES THE WORK

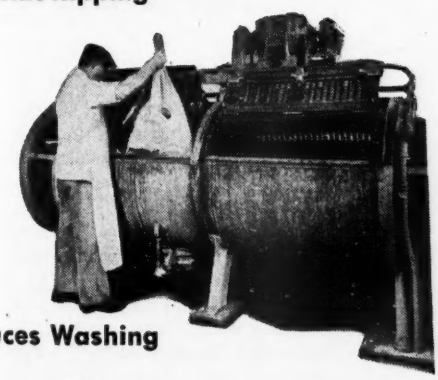


These two photomicrographs show that a Celite filter cake has smaller openings than the finest filter cloth. It's the filter cake—not the cloth—that removes the suspended impurities.



Saves Tailoring

Prevents Ripping



Reduces Washing

FILTER CLOTHS and their care often amount to considerable expense—especially when they must be washed in harsh bactericides and fungicides. The use of Celite* can substantially reduce this expense.

Celite is a chemically inert diatomaceous earth, used both for pre-coating and in the liquid to be filtered. The cake of Celite which builds up on the cloth forms a screen many times finer than the finest filter cloth mesh. This cake becomes a protective coating that traps gummy substances and harsh particles—prevents the impurities from clogging or damaging the cloth.

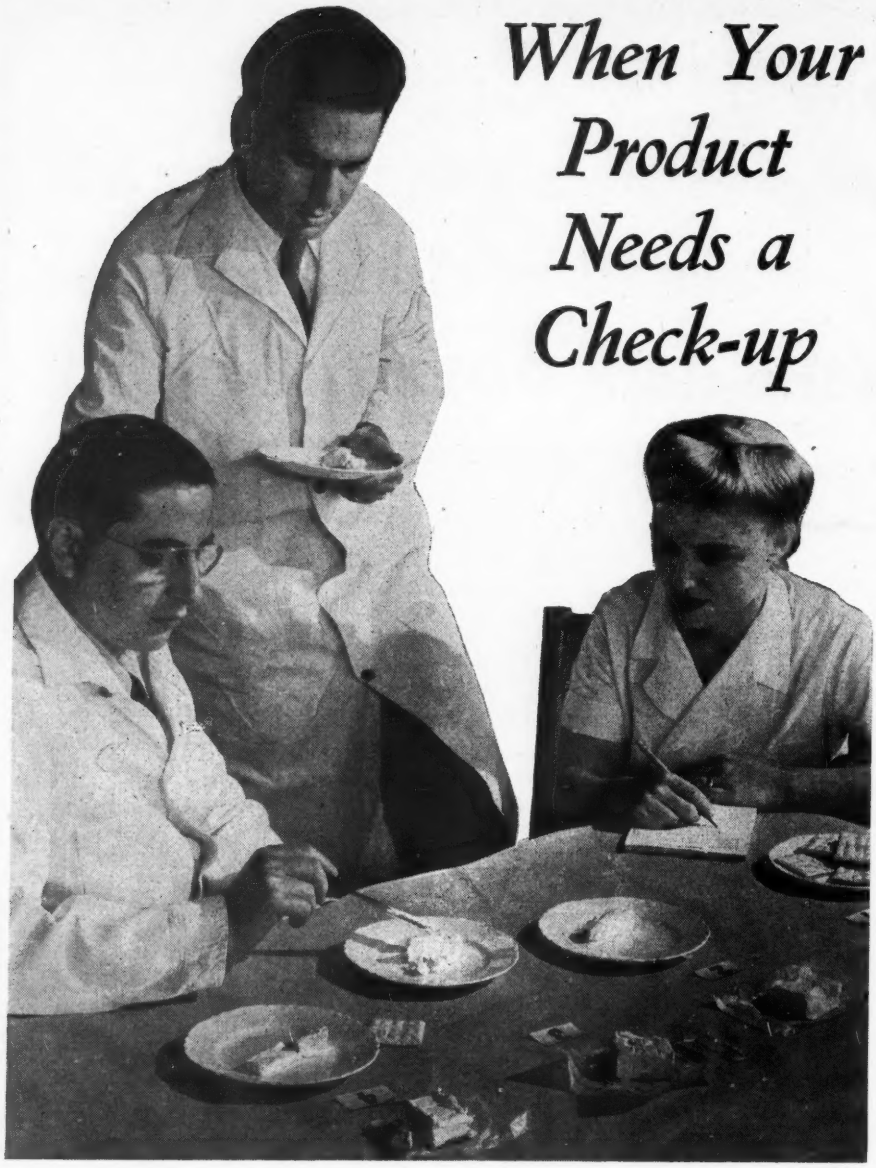
CELITE PRODUCES THE CLEAREST FILTRATES AT THE FASTEST FLOW RATES

Celite lets you filter more liquid on each run . . . reduces filtering costs all around. It comes in a number of grades for practically every combination of clarity and flow. Write Johns-Manville, Box 290, New York 16, N.Y., for complete information.

JOHNS-MANVILLE JM PRODUCTS

*Reg. U. S. Pat. Off.

Johns-Manville **Celite** Filter Aids and Fillers

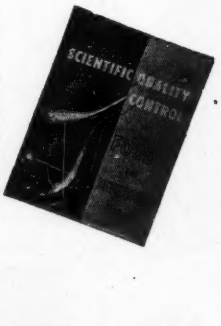


When Your Product Needs a Check-up

If your product is causing you trouble, the Schwarz experience in analyzing and rectifying difficulties of other food and beverage manufacturers may be useful to you.

For more than 75 years Schwarz Laboratories have been serving food and beverage plants with an authoritative *outside* viewpoint. Our extensive laboratory facilities include the most modern analytical and testing equipment and procedures. The analyses and tests are interpreted by long-experienced technologists who make specific recommendations. Our engineering service is equipped to plan and install efficient plant layout, equipment and operations.

An illustrated bulletin "Scientific Quality Control of Foods and Beverages" will tell you about Schwarz services. May we send you a copy?



Schwarz LABORATORIES INC

SCHWARZ LABORATORIES, INC.

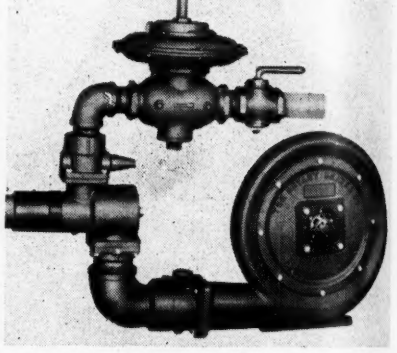
Food Analysts, Consultants and Engineers

202 East 44th Street **New York 17, N. Y.**

body, and a cooling unit, with associated valves and fittings, measuring only 2x2x2 ft., which is placed inside the body. To connect these units requires only three lines of tubing: Refrigerant supply, return line and a flexible shaft which drives the cooling fan. One small hole to admit these tubes is the only opening needed in the body.

Gas Combustion Units 29

A NEW line of packaged gas combustion assemblies adapted to firing boilers, air heaters, driers, ovens and wherever semi-open burners with controlled flames are desired, is announced by Bryant Heater Co., Dept. I, Cleveland 10, Ohio. Combining air handling, gas supply, mixing and burning elements, the assemblies are normally built as single burner units although they can be supplied



with twin-nozzle burners. Heart of the unit is the newly developed "Mixjector." Using air from a constant-pressure blower, it draws gas through a zero governor in whatever quantity is required for the selected mixture, and supplies the mixture to the burner nozzle. The velocity of the flame draws in considerable secondary air which keeps the nozzle cool. Available in 8 capacities, ranging from 400,000 Btu. per hr. to 3,300,000 Btu. per hr.

Control Instrument 30

MOORE PRODUCTS CO., Dept. I, Philadelphia 24, Pa., announces a new line of automatic-control instruments suitable for temperature, pressure, flow, liquid level, specific gravity, and all control applications in which pneumatic transmitters can be used as primary elements. The controller operates directly from the process transmitter, and sends an output pressure to the control valve without introducing frictional errors. Control action is completely independent of the operation of the indicator or recorder. All of the components have been combined in a "stack" of interchangeable parts and diaphragms without complicated external piping.

CATALOGS, BULLETINS

This digest of manufacturers' new publications is offered by FOOD INDUSTRIES Reader Service as a convenience for executives. The editors feature catalogs, data sheets and technical pamphlets likely to interest purchasing agents, superintendents, packaging men and food technologists.

Food Plant Equipment

Wrapping Machinery 50

Package Machinery Corp.—"Blueprint for larger sales and lower costs," a 4-page folder illustrating and describing machines for high speed wrapping of frozen foods, prepackaged fruits and vegetables, candy bars, cakes, textiles and other products.

Coating Machine 51

J. W. Greer Co.—6-page folder on the Greer coating machine. Contains photographs, line drawings and specification table. Also folders on the Greer reversible dough brake, upright dough brake and the high speed wire cut cake machine.

Scales 52

Toledo Scale Co.—12-page foldout, "Better Ways to Weigh, Count, Test, Measure and Control." Describes and illustrates Toledo scales for many different industries.

Overhead Trolley 53

"An engineered trolley for overhead conveyors, simple and rugged design," is the sub-title of Link-Belt Co.'s new 8-page illustrated folder, No. 2241, on their ball-bearing overhead conveyor trolley, which is used on the company's own conveyors but can also be purchased separately.

Vacuum Equipment 54

F. J. Stokes Machine Co.—16-page catalog 47-C on Stokes processing equipment. Describes, with many illustrations, vacuum impregnators, driers, stills, pans, evaporators, condensers, pumps and gages. Also drum driers and flakers and tablet compressing machines.

Stainless Steel Fittings 55

John B. Astell & Co., Inc.—2-color folder describing the fabrication of Robinson light wall stainless steel fittings.

Rotary Driers 56

Louisville Drying Machinery Co.—8-page bulletin No. 54 describes, with photographs and line drawings, operation of Louisville direct heat driers, both counter- and parellel-current. Also 8-page bulletin No. 65, "General American Process Equipment in the Citrus Industry." Contains photographs, flow sheet of a citrus waste-drying process and four tables of statistics.

Cream Separators 57

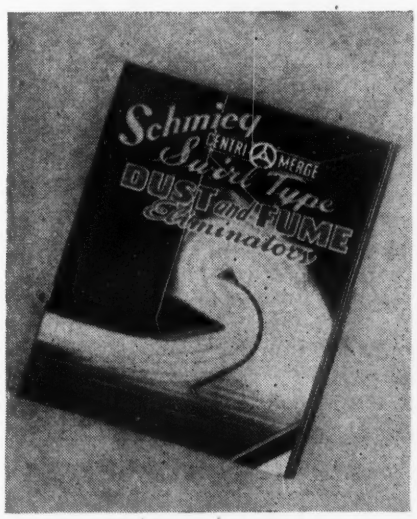
The Sharples Corp.—16-page brochure illustrating and describing Pressur-Seald cream separators and milk clarifiers.

Dependable Refrigeration 58

Caterpillar Tractor Co.—New 8-page booklet, "Dependable Refrigeration." Included are illustrations of the varied uses of Caterpillar diesel electric sets in ice plants, dairies, fruit storage houses and meat packing lockers. Description of the units being used as both primary and auxiliary sources of power directly for the ice plants themselves, or to operate ammonia brine compressors for milk trucks, are editorially and pictorially presented.

Dust Eliminators 59

Schmieg Industries, Inc.—12-page, 2-color folder describing the Centri-Merge swirl type dust and fume eliminator



made by this company. Illustrated with sectional views and schematic drawings.

Diesel Engines 60

A 2-color flier, Form 10311, describing its new type SS turbocharged diesel engines, built in 3 sizes: 6 cylinder, 675 hp.; 7 cylinder, 785 hp., and 8 cylinder, 900 hp., has been issued by Ingersoll-Rand Co. It contains hp. ratings, fuel consumption curves, a listing of new features and improvements and a table and diagram listing ratings and dimensions.

Steam Purifiers 61

Cochrane Corp.—New edition of its 12-page bulletin Bubl. 2725 describing steam purification units for the removal of moisture and solids in live steam. Application data, hook-up diagrams, installation photographs and accessory descriptions are all included.

Food Processing 62

Numerous advances in methods and equipment are interestingly set forth in the latest issue of Mojonnier Bros. Co.'s "Food," a 24-page brochure illustrating a series of new installations of processing equipment lately adopted by leading American and foreign food manufacturers.

Magnetic Separators 63

A 4-page, 2-color booklet, which describes the use of various types of magnetic separators for food applications, has just been released by the Eriez Manufacturing Co.

Variable Speed Motor 64

A new 4-page bulletin, 611-C, describing an a. c. motor having infinitely adjustable speed suited for driving such equipment as printing presses, paper and metal slitters, conveyors and other variable speed machines requiring constant torque input throughout their operating speed ranges, is available from The Louis Allis Co.

Gear Reducers 65

Many new sizes and types of enclosed herringbone-gear units for speed reducing and speed increasing service, are detailed and described in a new 68-page book, No. 1819, by Link-Belt Co.

Wire Cloth 66

Buffalo Wire Works Co., Inc.—6-page folder No. 596 on stainless steel wire cloth. Contains two pages of laboratory ratings on corrosion resistance; table of mesh sizes, gages, space between wires, openings and weights; photographs of each standard mesh.

Boilers 67

Kewanee Boiler Corp.—8-page catalog 97 "Kewanee Type C Steel Boiler." Illustrated with cross sectional views, line drawings and installation photographs. Contains dimension and rating tables.

Rectangular Magnets 68

A new 12-page catalog, 301-A, describing rectangular double-gap electromagnetic, suspended, spout and plate magnets and wet type magnets for submerged installations, has been issued by Dings Magnetic Separator Co.

Process Equipment 69

Marco Co., Inc.—New 20-page catalog No. 40 on Flow-Master processing equipment. Illustrated and described are: Flow-Master homogenizers, Kombi-nators, reactor, temperer, the new Roto-feed continuous mixer, and transferring, metering and proportioning pumps. Contains flow sheets for homogenization of milk, processing of lard, continuous production of bread dough, marshmallow and cake batter.

Water Demineralizers 70

American Cyanamid Co.—New 26-page 2-color booklet, entitled "Filt-R-Stil Demineralizers Deliver Low-Cost, Chemical Equivalent of Distilled Water." This profusely illustrated booklet

HOW TO GET THIS LITERATURE

Food Industries Reader Service now supplies tear-out coupon cards for your convenience in requesting copies of these new publications from manufacturers. Use one or more of the cards on the colored sheet bound near this page. Fill out, tear out, mail out and the Reader Service staff will see that your requests reach the manufacturers.

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AS QUICK AS A FLASH YOU CAN KNOW THE EXACT MEASUREMENT OF YOUR VALUABLE STORED LIQUIDS With LIQUIDOMETER Tank Gauges
100% AUTOMATIC
APPROVED BY UNDERWRITERS' LABORATORIES
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THE LIQUIDOMETER CORP.
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cites the advantages of demineralized water over distilled water, describes briefly the chemical and mechanical principles of demineralization by ion exchange, and gives data on calculating costs for demineralizing various raw waters. A 2-page spread is devoted to each of the standard demineralizers offered by the company; a picture, an engineering drawing, specifications, performance data, and a parts description are given for each unit.

Scales 71

The Exact Weight Scale Co.—4-page bulletin No. 3201 describing a line of Shadograph scales for industrial weighing.

Materials Handling

Motor Trucks 72

Mack-International Motor Truck Corp. —Mack Bulldog, a 12-page publication carrying service and performance stories of help to truck operators and drivers—all with liberal use of pictures.

Conveyors 73

Island Equipment Corp.—4-page bulletin entitled "And now you are able to obtain two different (roller and slide bed) types of Island ultimate light duty belt conveyor table and overhead empty carton conveyor."

Lift Truck Portfolio 74

A new comprehensive specification portfolio featuring illustrations, engineer's drawings, complete specifications and operating data on all models of Towmotor fork lift trucks and industrial tractors, has been published by Towmotor Corp. A pocket on one inside cover provides a neat file for a smaller 4-page folder containing condensed specifications on the various Towmotor models.

Pneumatic Conveyor 75

Sprout, Waldron & Co.—4-page folder on a Pneu-Vac system which aerates, cools, cleans as it conveys. Contains flow sheets for operation with hammer and attrition mills and for unloading bulk materials from freight cars.

Car Unloaders 76

Robins Conveyors Div. of Hewitt-Robins, Inc. — Bulletin No. 128-A describing and illustrating the Robins Car Shakeout, that unloads hopper-bottom cars in a few minutes with two men, without any manual labor, even with frozen materials. A 2-page spread of photographs show how the unit can be handled by any hoist that is able to lift a 5-ton load.

Control Equipment

Automatic Valves 77

A. W. Cash Co.—Bulletin 330 illustrating and describing the complete line of automatic valves and controllers made by this company.

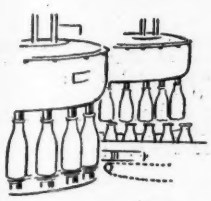
Control Instruments 78

Seely Instrument Co., Inc.—8-page bulletin describing and illustrating drum type controllers for process time and sequence control. Also 8-page illustrated bulletin on high pressure 3-way hydraulic valves.

Control Valves 79

The Foxboro Co.—36-page bulletin 277-2, "Pneumatic Control Valves and Controller Accessories." It contains a color page showing the various identifying enamel finishes offered; plates and tables of specifications for various valves and separate sections on the Vernier Valvactor for high-accuracy.

Nothing is more precious than the Purity of your products

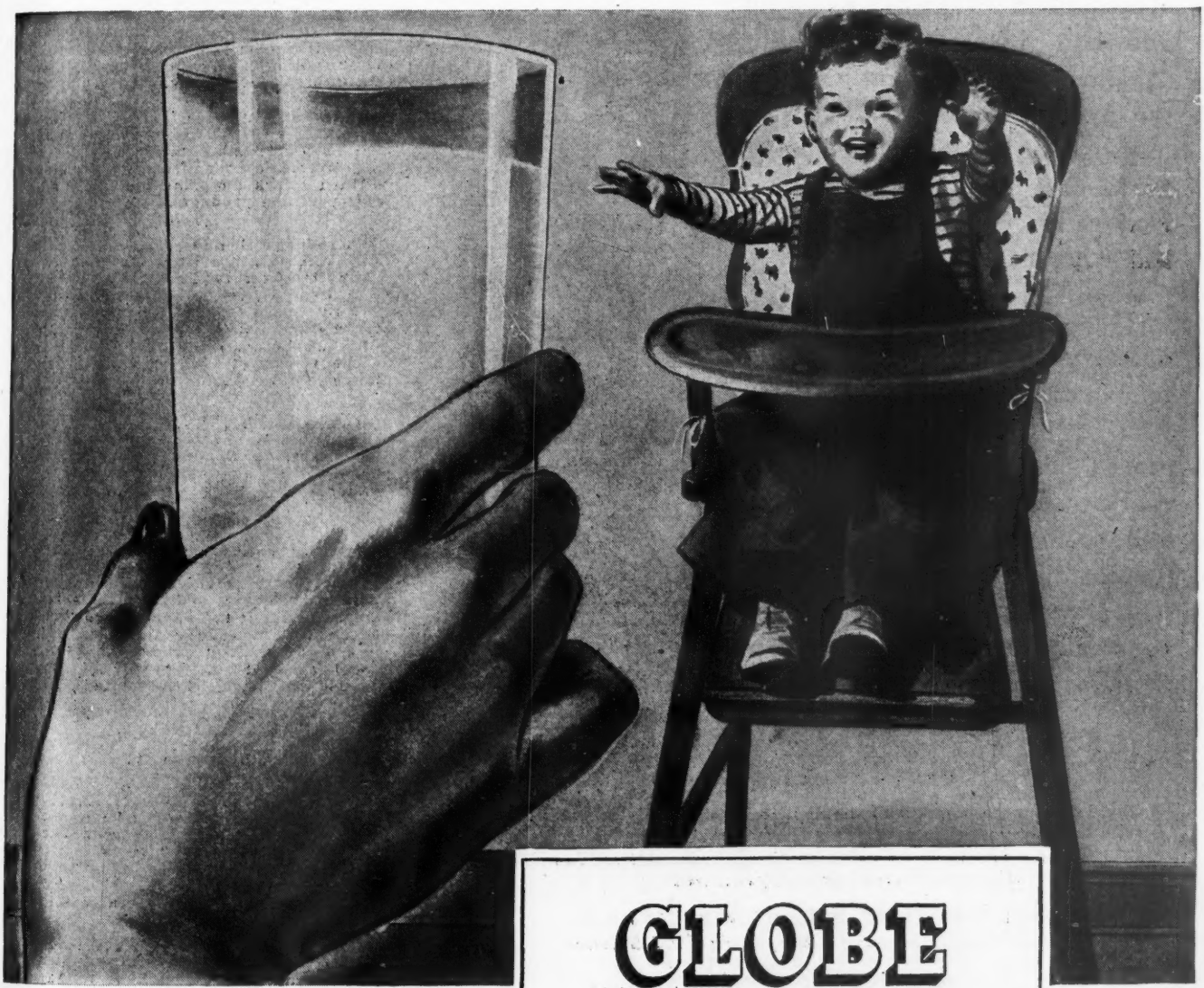


Of course you won't take chances on the purity of your product — that's the most important reason for using stainless steel tubing in your processing machinery and equipment.

At the same time don't overlook the costs involved in the operation and maintenance of processing equipment. No other tubing equals stainless steel in long service life and resistance to corrosion in most food and chemical processing applications — no other tubing is so easily kept clean and sanitary without impairment of the tubes themselves.

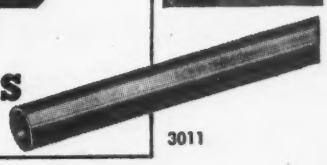
To gain the most in stainless tube advantages, select with care — not just any stainless steel analysis will do for all jobs. Consult with Globe — as specialists in tubing manufacture and a broad experience record in stainless steel tubing (both seamless and welded) we offer valuable advisory technical service to both builder and user of processing equipment.

Globe Steel Tubes Co., Milwaukee 4, Wisconsin.



GLOBE
Stainless
STEEL TUBES

Write for Bulletin No. 115 and complete information on Globe Seamless Stainless Steel Tubing and Gloweld Welded Stainless Steel Tubing.

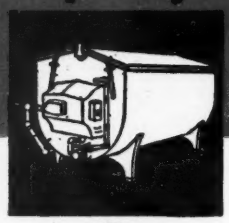


3011

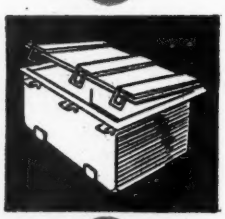
You can count on

OAKITE CLEANING

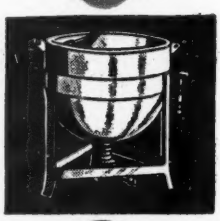
to help protect product purity!



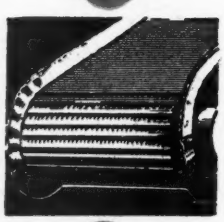
PASTEURIZERS



BELLY BOXES



KETTLES



CONVEYORS

Your choice of detergent and method of application for sanitizing your milk and food processing and handling equipment can importantly influence the quality of your product. Using a material not specifically designed for the job or applying a suitable material incorrectly will boost bacteria counts and jeopardize product quality.

Specially-designed Oakite cleaning compounds can help you to safeguard your product quality through their proved ability to remove completely every trace of bacteria-harboring milk or food residue. Oakite Techniques, tailored to fit your individual requirements, can help you to expedite your daily clean-up practices . . . put them on an efficient, low-cost basis.

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Oakite welcomes the opportunity, through their nation-wide Technical Field Service Staff to assist you in setting up a smooth, trouble-free plant and equipment cleaning program. Write today for FREE demonstration . . . helpful literature. Your inquiries are invited, promptly answered!

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MATERIALS
METHODS
SERVICE

Specialized Industrial Cleaning

positioning of valve plungers. Information is supplied on computing valve sizes together with tables and formulas. Air filter sets, ventilating dampers and other accessory equipment are illustrated and described.

Flow Meters 80
Fischer & Porter Co.—New 32-page bulletin illustrating and describing the numerous advantages of the Flowrator meter for flow rate measurement.

Strip Chart Recorder 81
A 16-page technical data book on Capacilog electronic scriber has just been released by the Wheelco Instrument Co. Operational diagrams, schematic drawings, charts and listings explain its diversified functions.

Viscometer 82
Brookfield Engineering Laboratories—8-page catalog on the Synchro-Lectric viscometer. Illustrates and describes the 4 models adaptable to any and all viscosity problems and the newly developed extension spindle.

Plant Supplies

Can Label Adhesive 83
A 4-page illustrated bulletin No. 16 by Paisley Products, Inc. describes a complete range of can label adhesives designed to meet the majority of labeling, handling and storage conditions encountered in the packaging industry.

Essential Oils 84
Magnus, Mabee & Reynard, Inc.—48-page price list and catalog of essential oils, aromatic chemicals, oleoresins, certified colors, flavoring materials and basic perfume products.

Ion Exchange Resins 85
The role of Amberlites, ion exchange resins, in water treatment and chemical processing, is the subject of a new 22-page booklet by the Resinous Products & Chemical Co. It deals with the contributions made by the Amberlites in the transportation, chemical, canning, bottling, ice and other industries.

Hose 86
Raybestos-Manhattan, Inc.—Bulletin 6893 describes Condor creamery and packers hose available in two types: Condor Homo-flex G.O.P. and Condor G.O.P.

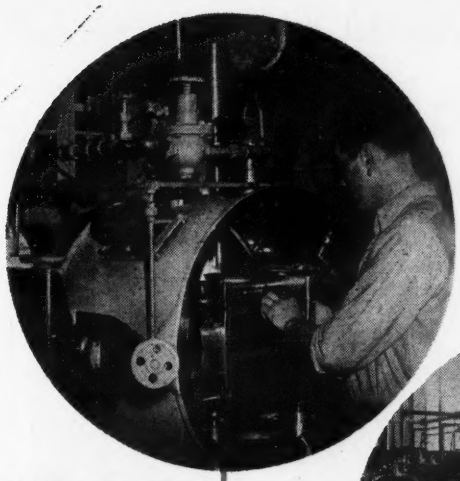
Sanitizing 87
Pittsburgh Plate Glass Co.—Form B-751, a 24-page booklet containing instructions on how to use Pittcide as a sanitizing agent in bakeries, breweries, beverage plants, cheese factories, dairies and other food processing plants. Also Form B-752, a 16-page booklet on the use of Pittcide to safeguard milk production.

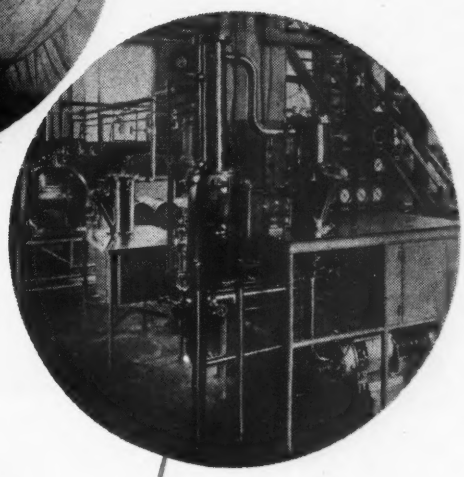
Miscellaneous

Protective Coatings 88
The Truscon Laboratories have issued an illustrated folder on Truscon Paratex chlorinated rubber floor coating which beautifies, protects and preserves concrete and wood floors. Also folder on Paratex rubber base metal coating.

Shipment Sealing 89
Better Packages, Inc.—16-page illustrated handbook shows how to safeguard shipments against the four most common sealing hazards.

Foamglas Insulation 90
Pittsburgh Corning Corp.—12-page illustrated bulletin, "PC Foamglas Insulation for Roofs." Describes Foam-





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The TRIAL BALLOON way of learning —at the start—whether your contemplated process has commercial possibilities is to submit your processing problems to BUFLOVAK and learn right away such things as production cost data, capacity, and characteristics of the finished product.

BUFLOVAK maintains a Research and Testing Plant embodying the latest and most advanced design which, for the past 30 years, has *studied and completed over 5,000 research processing problems!*

Problems solved include drying evaporation, extraction, impregnation, solvent recovery, crystallization and food processing.

These tests safeguard your investment in BUFLOVAK equipment by showing unmistakably *what will be obtained from a given process!* It is your assurance of the most efficient type of equipment!

Write today for full details and illustrated booklet describing BUFLOVAK Evaporators, Dryers, Solvent Recovery and Distillation Equipment, Chemical Plant Equipment, Etc.

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Equipment Division

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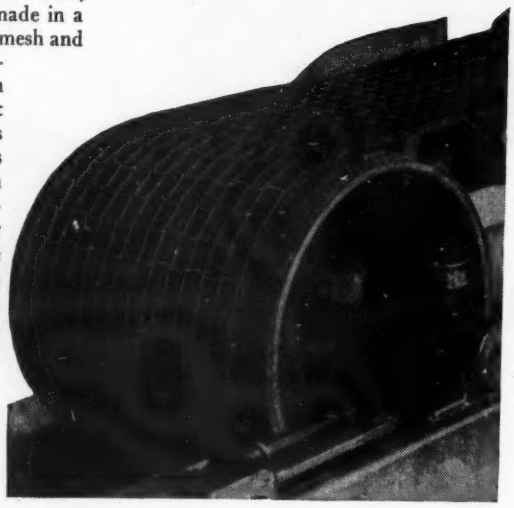


CYCLONE FENCE DIVISION · American Steel & Wire Co. · USS CYCLONE "Red Tag" CONVEYOR BELTS · UNITED STATES STEEL

By the makers of Cyclone Fence

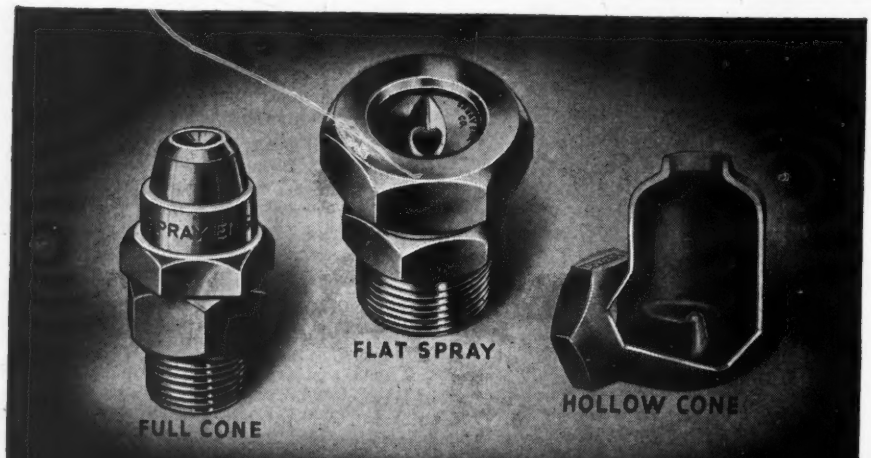
CYCLONE FENCE DIVISION

(AMERICAN STEEL & WIRE COMPANY)

Dept. H-127, Waukegan, Illinois

United States Steel Export Company, New York

UNITED STATES STEEL



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SPRAY ENGINEERING CO.

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glas, with special emphasis on its ability to retain insulating value permanently. Gives full instructions for applying under built-up roofing. Also bulletins on "Foamglas Core Wall Insulation" and "Foamglas Insulation for Floors."

Displaying Vegetables 91

National Association of Ice Industries —Two 14-page brochures. "The Iced Method of Displaying Vegetables" describes, with many illustrations, custom built cases and how to build iced display units. Contains curves and data on conservation of vitamins with snow ice. "How to Display the Iced Methods Way" tells how to protect garden freshness, with special instructions covering the various commodities. Profusely illustrated.

Steel Service 92

Joseph T. Ryerson & Son, Inc.—12-page booklet giving a quick story of the stocks, facilities and personnel at the company's new plant in Los Angeles.

Fire Protection 93

American LaFrance Foamite Corp.—24-page booklet featuring the fire-protection equipment manufactured by this company.

Case Sealing 94

National Adhesives — Comprehensive booklet, "Successful Case Sealing," features sections based on experience and information obtained during the past few years, in cooperation with freight shippers, the Railway Express Agency and the railroads.

Laboratory Equipment 95

E. H. Sargent & Co.—1947 supplement, "Laboratory Apparatus and Equipment." 38 pages illustrating and describing the equipment made by this company.

Pressure-Treated Wood 96

"Economical and Permanent Construction with Pressure-Treated Wood," is the title of a 26-page, profusely illustrated brochure recently issued by Koppers Co., Wood Preserving Division.

Solderless Wiring 97

Compiled for design and production engineers, Aircraft-Marine Products, Inc., announces an unusual selection data book on their entire line of solderless wiring devices. This attractive, plastic-bound volume displays the various types of solderless terminals, their features and their applications in a series of concise, informative, illustrated charts, index-tabbed for quick references.

Building Maintenance 98

Continental Asbestos & Refining Corp.—32-page illustrated catalog outlining specific maintenance problems and explaining how this company's products may be used to solve them.

Plastics Bulletin 99

E. I. du Pont de Nemours & Co.—12-page booklet on du Pont plastics. It highspots the special characteristics and combinations of properties which have made possible so many successful product applications.

Fire Extinguishers 100

Pyrene Manufacturing Co.—New circular illustrating and describing the cartridge-operated 2½-gal. Pyrene water type and Pyrene anti-freeze fire extinguishers.

Laboratory Equipment 101

Research Products Co.—Folder on Humi-Temp fermentation and proof cabinets. Contains illustrations and specifications.

FOOD TECHNOLOGY

NEW DISCOVERIES AND INVENTIONS

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FRUITS

Treating Juices

HOMOGENIZING, blending, dispersing and filtering fruit and vegetable juices, by subjecting them to a centrifugal screening effect, is the subject of a recent patent. The machine in which the process is carried out is adjustable so that the solid content or heavier liquid constituent of the juice can be treated to remain in suspension, go into solution, or be filtered therefrom to a desired extent. The apparatus comprises a vertical drive shaft centered in a structure forming a treating chamber into which material is fed. The bottom of the chamber is a centrifugal feeding rotor attached to the shaft and fitted with a series of impellers designed to throw the feed outwardly to an annular screen which is the outlet of the treating chamber, and from which the finished product is discharged.

In homogenizing pasteurized carrot juice, for example, the material is fed onto the rotor running at about 3,600 rpm. During rotation the solid constituents impinge against the impelling and directing surfaces of the treating chamber, as well as against the screen, and become broken up so that they will remain in suspension in the liquid. By adjusting the speed of the rotor and the aperture of the screen, the machine can be adapted to a variety of materials and products. It may also be adjusted to act as a filter or as a blender and mixer.

Digest from U. S. Patent 2,425,689, issued August 12, 1947, on an application dated June 9, 1943, to H. G. Schwarz, Denver, Colo., and assigned to The Schwarz Engineering Co., Inc., San Francisco, Calif.

Citrus Acids Removed

BY the use of ion-exchange resins it is practicable to remove from 85-90 percent of the acids from orange and grapefruit juices. The process consists of stirring the fruit juice with the granulated resin for a short time at room temperature. The resin is allowed to settle and the juice decanted. When evaporated in open kettles the bland juices make well colored and flavored sirups. For this purpose the juices should be freed from suspended matter by filtration. Once clear, the sirups remain so during evaporation. Ascorbic acid originally present suffered slight losses during both the resin treatment and evaporation.

Digest from "Preparation of Sirups from Orange and Grapefruit Juices by the Use of Ion-Exchange Resins," H. C. Gore, presented before the Div. of Sugar Chemistry and Technology, Amer. Chem. Soc., New York, N. Y., September 17, 1947.

FATS and OILS

Deodorizing Oils

CONTINUOUS deodorization of animal and vegetable oils is revealed in specifications of a recent patent. The principal piece of apparatus is a bubble column divided into an upper deaerating chamber and a lower deodorizing section. Oil passes first through the deaerating chamber before being heated to the high temperature necessary for complete deodorization. Unvaporized oil from the upper section is heated and passed into the lower chamber where, due to high vacuum and stripping steam, the undesirable constituents are volatilized and discharged. Reduced installation and operating costs are claimed.

Digest from U. S. Patent 2,422,185, issued June 12, 1947, on an application dated August 20, 1942, to Dion K. Dean, Rahway, N. J., and assigned to Foster Wheeler Corp., New York, N. Y.

BAKING

Dextrins in Flour

FLOUR with a high maltose value, over 2.3 percent by the Rumsey test or one of its modifications, is likely to yield bread with sticky crumb. Dextrins in the flour have also been suggested as contributing to crumb stickiness. Trial bakings have confirmed this. Data were obtained during the period Oct. 1944 to Jan. 1945, when some English flours contained a proportion of sprouted wheat.

Flours having as high as 16.5 percent dextrin, and maltose figures of 2.66, were baked. In laboratory bakings a flour with 13.0 percent dextrin made a bread of slightly sticky crumb. This figure appears to be the upper limit for satisfactory baking. The action of α-amylase during the early stages in the oven is responsible for the high dextrin content of sticky crumb breads. Maltose figures do not run parallel to dextrin figures.

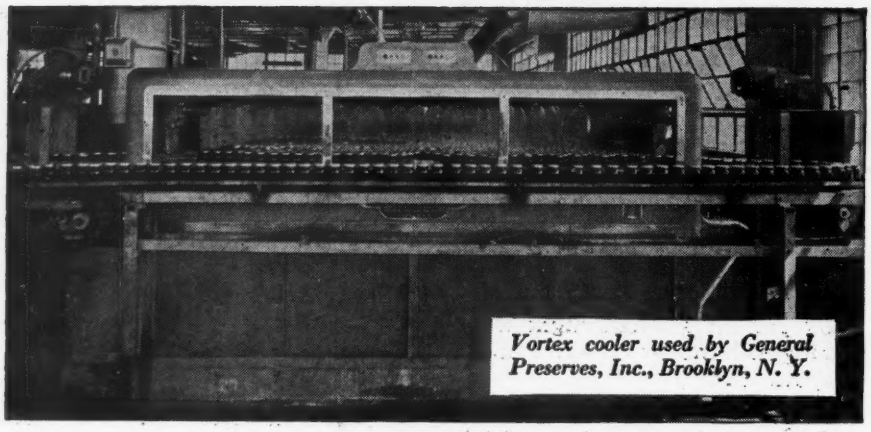
By adding hydrochloric or lactic acid to the doughs, pH values of 5.0 or slightly lower were produced without affecting the α-amylase activity appreciably. Lowering the pH to 4.65 reduced dextrin production, but coagulated gluten proteins and yielded a loaf of reduced volume, tough crumb and leathery crust. Addition of acid to doughs to reduce crumb stickiness due to dextrin formation is not a safe practice with flours containing added calcium carbonate.

Digest from "Dextrins in Flour and Yeast Raised Bread," by W. Cunliffe, *Journal of the Society of Chemical Industry*, vol. 66, 187-89, June, 1947.

Homogenized Bread

BREAD doughs made in the usual manner produce bread having as good characteristics as that produced from doughs in which the fat is homogenized. This is the conclusion resulting from experiments at the Laboratory of the American Institute of Baking.

Control doughs were made in the



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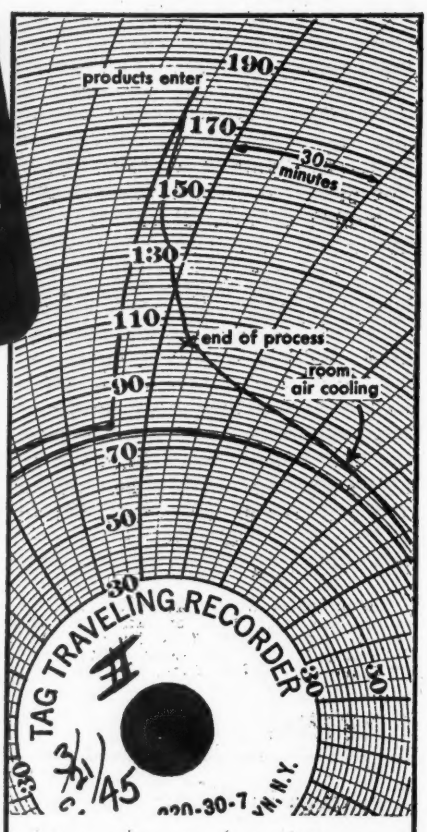

The process recorded above is cooling 1 lb. hot marmalade jars 80° F. within 20 minutes to packing temperature.

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usual way, with either hydrogenated shortening or lard as the source of fat. Homogenized doughs were made of water, milk, sugar and shortening that had been passed through a commercial homogenizer several times at 3,500 psi. pressure. Each loaf was wrapped after one hour out of the oven. Bread from each dough was scored and the compressibility determined. It is the opinion of the authors that homogenization in bread production is of little value in improving quality.

Digest from " 'Homogenized' Bread," by W. B. Bradley and C. B. Faulstich, Bulletin No. 30, American Institute of Baking, August 19, 1947.

CANNING

Vitamin Content of Stored Canned Foods

RETENTION of vitamin content of stored canned fruits and fruit juices has been studied with reference to the effect of time and temperature of storage. Constant temperature storage chambers were used for samples kept at 50, 65, and 80 deg. F. for 4, 8, and 12 months. A second group of samples was stored for one year in warehouses in 9 cities throughout the United States. Data indicated that losses of ascorbic acid and thiamine in fruit and fruit juices depend more on temperature than on length of storage.

In the first group there was no significant loss in ascorbic acid, thiamine, or carotene at the end of 12 months' storage at 50 deg. F. Retention was also generally good at 65 deg. Niacin retention was complete at 50 and 65 deg. for peaches and tomato juice, but tomatoes showed reduction of 93 percent in 8 and 12 months regardless of temperature. At 80 deg. F. there was definite loss of ascorbic acid and thiamine after 8 months, increasing with 12-month storage. Average retentions for all fruits and juices after a year's storage at 80 deg. were, in percent, ascorbic acid 80, thiamine 87, carotene 94 and niacin 98.

In the second group, retention of ascorbic acid and thiamine decreased as related to the yearly average temperature increase, except that orange juice showed practically no loss of thiamine. Retention of ascorbic acid varied from a low of 73 percent for orange juice and 83 percent for tomatoes at New Orleans to a high of 96 and 106 per-

(*Continued on page* 196)

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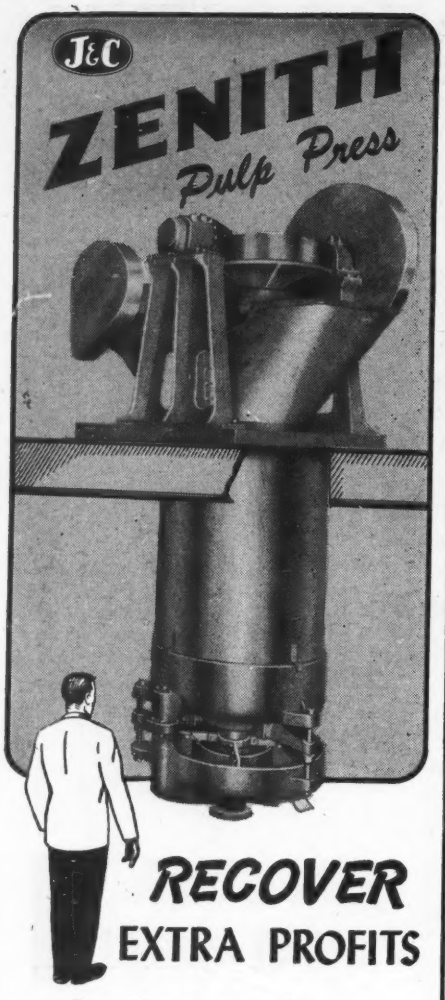

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cent, respectively, at New York. Retention of thiamine in tomatoes varied from 79 percent at Tampa to 96 percent at New York.

Digest from "Effect of Time and Temperature of Storage on Vitamin Content of Commercially Canned Fruits and Fruit Juices (Stored 12 Months)," by D. S. Moschette, W. F. Hinman, and E. G. Halliday, *Industrial and Engineering Chemistry*, vol. 39, no. 8, 994-999, August, 1947.

VITAMINS

Producing Riboflavin

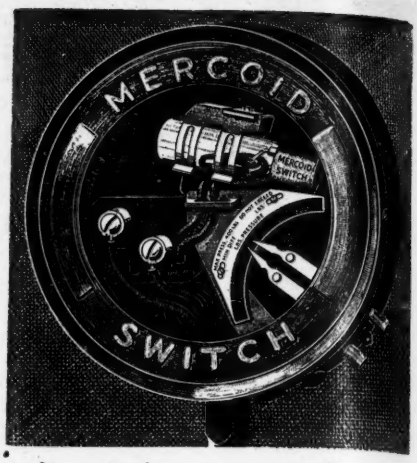
CERTAIN yeast organisms under controlled conditions of fermentation can produce riboflavin in far greater amounts than previously known, according to a recently patented process. Control of the iron content to less than 10.3 μ g. per 100 c.c. of growth medium is the critical factor. The inoculum is an organism of the genus Candida, species *guilliermondia* and *flareri* preferred. A typical culture medium is prepared by dissolving in 200 c.c. water, 0.5 g. KH_2PO_4, 0.5 g. $MgSO_4 \cdot 7H_2O$, 2 g. urea, 2 g. asparagin, 1 μ g. biotin (free acid) and 40 g. glucose. To this basal medium is added 10 mg. of 8-hydroxoquinoline dissolved in 2 c.c. chloroform. After shaking the mixture the chloroform is withdrawn. This process is repeated with the addition of 8-hydroxoquinoline in alternate extractions with the chloroform until the settling layer seems colorless, indicating substantial removal of iron. Higher concentrations of iron are obtained by addition, and iron-free water is added to make up one liter. Portions of this medium are sterilized, inoculated and incubated.

Digest from U. S. Patent 2,424,003, issued July 15, 1947, on an application dated December 8, 1944, to F. W. Tanner, Jr., and J. M. Van Lanen, Peoria, Ill., and assigned to United States of America, as represented by the Secretary of Agriculture.

Vitamin C Retention

VEGETABLES packed in ice retain their vitamin C content to a much greater degree than by any other method of fresh storage, though the amount of vitamin C loss varies widely from one vegetable to another. Cabbage, for example, retained 90 percent of its initial 50-70 mg. of ascorbic acid after 4 days at 80 deg. F., while Swiss chard or asparagus held less than 20 percent of their initial 30-40 mg.

Fourteen vegetables were studied to see the effect of packing in ice for 2 days. None suffered any severe vitamin C loss. All of them gained in weight, the average in-



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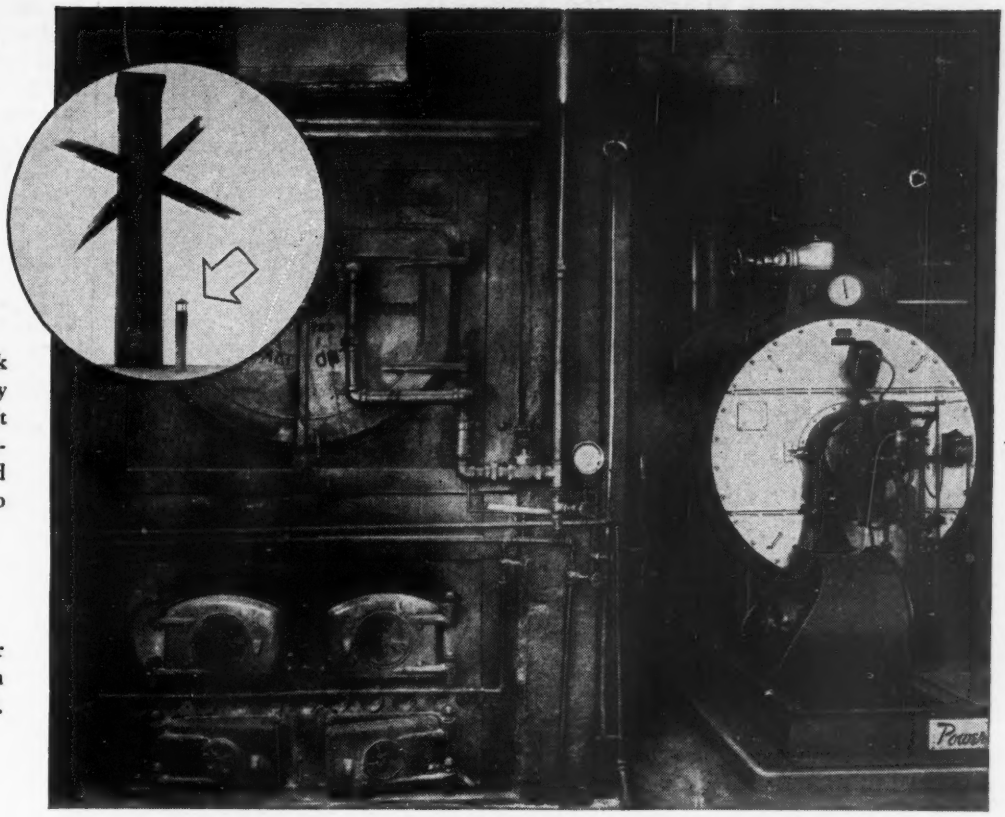

Inset. Note how high, costly stack is eliminated at the Hart Battery plant, through the forced-draft feature of their new "Powermaster" unit. Only a small—and inexpensive—vent is needed to carry off combustion gases.

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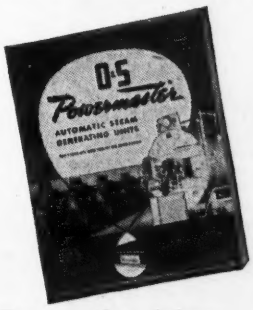

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crease being 4 percent. Leafy vegetables showed the greatest increase. The data indicates that packing in ice is superior to refrigeration at 50 deg. F. or to storage on top of ice.

Digest from "Effect of Crushed Ice Refrigeration on Conservation of Vitamin C Content and on Retention of Weight of Ohio-Grown Vegetables," by M. M. Patton and L. H. Miller, *Food Research*, vol. 12, 221-228, May-June, 1947.

ENGINEERING

Spray Drying Apparatus

PARTICULARLY adapted to the final drying of food products that have been concentrated by evaporation, such as milk, is a recently patented spray dryer. The apparatus design is such as to yield a product of low moisture content in a single drying chamber in which the material is subjected to a temperature of 280-350 deg. F. for a short time. The material to be dried flows first transversely and then parallel to the flow of the drying current. The equipment comprises a conical drying chamber with an upper cylindrical portion into which hot air is driven tangentially. Concentrated milk is sprayed across the stream of hot air and then flows with it in a downward spiral to the apex of the cone where most of the powder is collected and withdrawn. The air rising through the center of the chamber is discharged through the top and conducted to a cyclone where the dried residue is recovered.

Digest from U. S. Patent 2,422,706, issued June 24, 1947, on an application dated February 9, 1942, to George Tooby, Prentice, Wis., and assigned to R. C. Lilly, St. Paul, Minn.

Food Freezing Control

COMPARATIVE freezing tests on a number of food products show the need of controlling the freezing action within the container as freezing progresses. Taking citrus juice as an example, standard No. 10 cans of juice were frozen by different methods: Conventionally in a room at 0 deg. F., and by rotating the container on its horizontal axis in a multitubular freezer at a temperature of –20 deg. F. The product of the first method showed a ring of almost clear frozen water extending inward for ¾ in. from the can surface, with gradually increasing color toward the center, where there was a slushy core of complex nature. By contrast, the product in the can that was agitated during freezing was uniform in appearance, with an open central

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core of air or gas. The time required by the first process was measured in hours, compared with minutes for the controlled method.

Digest from "The Regulation of Food Freezing Action," by W. J. Finnegan and Thomas F. Carter, *Refrigerating Engineering*, vol. 54, 132-134, August, 1947.

MICROBIOLOGY

Microorganisms In Sugar Liquors

MICROORGANISMS of mesophilic types are most often encountered in the liquors of very low sugar concentration that arise from washing of raw sugar bags, bone char filters, or sweet waters obtained from wet-type dust collectors. The organisms are ordinary types of air and waterborne bacteria and yeasts. Lactic acid formers often predominate and can cause sugar losses by acid formation and inversion. Neutralization of acidity encourages lactate formation. Buffering with disodium hydrogen phosphate to reduce inversion encouraged the growth of *Streptococcus leuconostoc* and the formation of gummy dextrans. By aeration of the liquors, the gum forms in rice grain-like particles instead of in masses, and offers a possibility of commercial gum production.

Heating reduces the count of mesophil organisms but increases the invert sugar concentration and color. Hypochlorite solutions are effective only at uneconomically high chlorine concentrations, and result in high ash content. They are effective for disinfection of tanks and pipe lines after all sugar has been removed by flushing with water. Hypochlorites do not destroy *leuconostoc*, and bisulphites are better against this organism. Ultraviolet lamps are effective only when illuminating very thin layers flowing at slow rates. Supersonics or high frequency electric currents have not proved useful on sugar liquors.

Osmophilic yeasts may be found in raw cane or beet sugars or in raw sirups in the refineries. They are usually species of *Schizosaccharomyces or Zygosaccharomyces*. They may cause extensive damage in sirups stored in the refinery and in cattle feeds containing molasses. Flash sterilization, by heating to 194 deg. F. for 1-2 min., gave a 99.7-100 percent kill of osmophils and 93.5-99.9 percent kill of mesophils, without appreciable increase of invert sugar.

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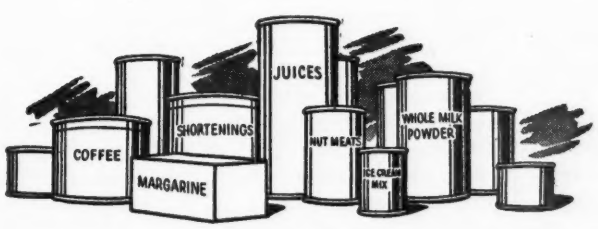

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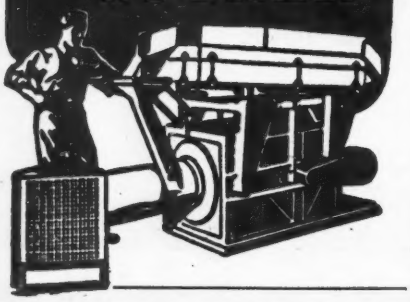

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sugars in almost completely eradicated by carbonation and filtration but sirups are reinfected in subsequent operations. All refinery dusts examined contained thermophils. Extensive air conditioning can protect the refined sugar end of the refinery from such dusts.

Digest from "Microorganisms in Raw and Refined Sugar and Intermediate Products," by H. C. S. de Whalley and M. P. Scarr, *Chemistry and Industry*, 531-36, August 30, 1947.

DAIRY

Curing Packaged Cheese

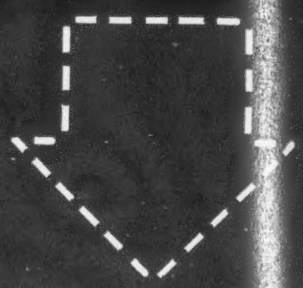
ACCORDING to a recent patent, Cheddar and similar cheeses may be packaged for curing by wrapping in a thin, limp, moisture-proof, oil-resistant material, and subjected to pressure to make them air free. On removal of the press cloth, the cheese curd is quickly enclosed in a preformed encircling bag or tube. The preferred wrapping material is rubber hydrochloride film about 0.0004 in. thick. Other acceptable materials are metal foils, coated sheets and wax-rubber sheet known as Parafilm. After the cheese is wrapped, a stiff container is placed over it and the assembly inverted. The wrapping is carefully folded over the top of the curd and covered with a pressure plate that fits snugly inside the container. This, in turn, is covered with a pressure block somewhat smaller in area which prevents the cover from resting on the top edges of the container, so that when pressure is applied the cheese is forced to assume the shape of the container. Entrapped air is forced upward and out of the container, enabling the cheese to be cured under pressure in an air-free condition.

Digest from U. S. Patent 2,424,693, issued July 29, 1947, on an application dated June 9, 1943, to L. H. Jones, Chicago, Ill., and assigned to Wingfoot Corp., Akron, O.

MISCELLANEOUS

Calcium in Soil Affects Human Nutrition

NUTRITIONAL values of meat and milk from animals fed on plants from properly limed soils are superior to those fed on plants from soils very low in available calcium. Such plants furnish entirely different food for humans or animals than the same plant species from untreated soil when fortified with inorganic calcium salts.



RESULTS

Case History No. 16
Non-Metallic Minerals
Packaging costs reduced 75%.

Case History No. 17 Sugar
Packaging costs reduced 50%.

Case History No. 18 Chemical
Manufacturer saves ¾¢ per lb.; customer saves ½¢.

Case History No. 19 Sand Product
Solved a problem of dust. Workers find it easier to handle Multiwall

Case History No. 20 Graphite
A 66% increase in packaged output with the same number of men.

St. Regis Packaging Systems are designed to meet a wide range of product requirements and plant layouts. Packers are available in a variety of sizes and types, with filling speeds as high as twenty-four 100-lb. bags per minute—with one operator. Over 400 commodities—rock products, fertilizers, chemicals, foods, and feeds—are now being packaged in sturdy, low-cost multiwall paper bags.

from SUGAR to SAND

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Case History No. 16 — Multiwalls are filled and weighed by 105-FV packers.

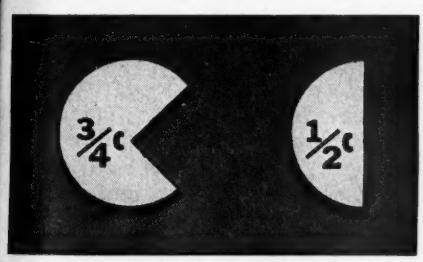
Case History No. 17—Multiwalls lend themselves to mechanical handling methods.

CASE HISTORIES TELL THE STORY

Five recent case histories—factual reports by manufacturers of five different products—give the details of better, faster, cheaper packaging with a St. Regis System. Multiwall paper bags and valve bag filling machines cut labor costs and container costs and at the same time speed up packaging operations. Moreover, customers like clean, protective, easy-to-handle Multiwalls.

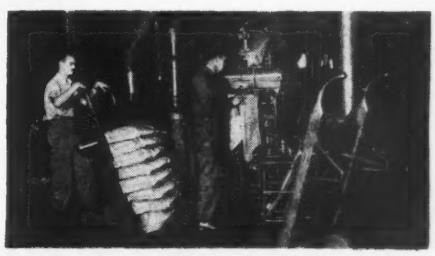
If you pack a granular, pulverized or powdered product, look into the advantages of a St. Regis Packaging System. It can save you money and greatly increase packaging efficiency.

Write today for free copies of any or all of these illustrated case histories. Then ask to have a St. Regis packaging engineer discuss your problems with you and explain how this modern packaging system can be used in your business. Just call or write the nearest St. Regis office.



Case History No. 18—Producer saves ¾¢ per lb.; customer saves ½¢.

Case History No. 19 — Multiwalls protect against moisture-vapor penetration in transit and in storage.



Case History No. 20 — High-speed 152-PB valve bag filling machine gives cleaner, cheaper operation.

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Recent investigations show that the addition of calcium to a soil influences the availability and absorption of other elements, which in turn alters the physiological processes and the synthesis of organic compounds within a plant. Evidence continues to accumulate that animal well-being and the composition of animal products are closely associated with those soils that furnish a balanced supply of nutrients.

Digest from "Calcium Content of Soils and Fertilizers in Relation to Composition and Nutritive Value of Plants," by G. E. Smith and J. B. Hester, Campbell Soup Co., Riverton, N. J., presented before the Div. of Fertilizer Chemistry, Amer. Chem. Soc., New York, N. Y., September 16, 1947.

Molecular Weight Reduced by Grinding

HIGH molecular weight materials, starch or gelatin for example, when subjected to long periods of dry grinding, are known to undergo pronounced changes in properties indicative of a reduction in molecular weight. In experiments on three pectins it was shown that a similar degradation of the molecules occur on prolonged grinding in a ball or pebble mill.

The first pectin was a 100 grade "rapid set" product in light friable flakes. In 45 hr. of grinding its gel strength became too weak to measure. Its calcium pectate value underwent very little change. A laboratory prepared apple pectin, precipitated with alcohol, was more resistant, but its gel strength disappeared after 1,100 hr. Calcium pectate value also decreased during grinding. Viscosity of its solutions decreased regularly, continuing to do so long after grinding had destroyed the gel-forming property. A citrus pectin of high gel-strength was similarly treated. Calcium pectate values and gel strengths decreased as before, but there was no significant change in acidity or saponification value.

Results indicated that viscosity and gel forming power, properties associated with molecular size, were markedly modified by grinding while chemical properties were little changed. Depolymerization of pectin molecules explains these results as well as the slight decrease in calcium pectate value, since calcium galacturonate, arising from individual galacturonate molecules split off in the grinding, does not precipitate readily.

Digest from "Pectin Studies—Part II. The Effect of Dry Grinding," by L. H. Lampitt, R. W. Money, B. E. Judge and A. Urie, *Journal of the Society of Chemical Industry*, vol. 66, 157-60, May, 1947.

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BOOKS

Food Crop Ills

DISEASES OF FIELD CROPS. By James G. Dickson. Published by McGraw-Hill Book Co., 330 W. 42nd St., New York 18, N. Y., 1947. 427 pages; 6 x 9 in.; cloth. Price, $4.50.

The aim of this book has been to present as much basic information on field crop diseases as possible in the relatively brief space afforded. The authors make no claim to offering a complete treatise on this broad subject.

They do make available, however, a convenient reference outline of current information of diseases in the field plant group.

The major portion of the book deals with food crops. Diseases of cereals and grasses comprise more than half the volume, while diseases of legumes, including soybeans, take up most of the balance.

The author is professor of plant pathology at the University of Wisconsin. He has prepared here what is primarily a text book, but one that should prove useful to food manufacturing executives directly concerned with raw materials in the field crop category.

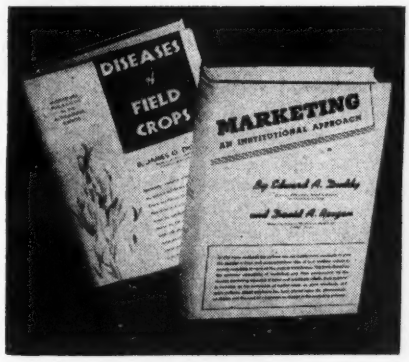
Analytical Handbook

VOLUMETRIC ANALYSIS, Second edition. By I. M. Kolthoff and V. A. Stenger. Published by Interscience Publishers, Inc., 215 Fourth Ave., New York 3, N. Y., 1947. 374 pages; 6¼ x 9¼ in.; cloth. Price, $6.

This revised edition, like the first published in 1929, is based upon a German monograph published in 1928. The food chemist will find a selection of useful and reliable procedures in making a wide variety of determinations.

The book follows the classical plan of presentation by type of reaction — acid-base, precipitation, and complex-formula reactions. In addition to the usual methods of volumetric estimation of inorganic materials, the reader will find numerous examples and applications in the field of organic chemistry, including procedures for many substances and radicals of interest to the food technologist.

There is a comprehensive index of authors, valuable for finding methods identified by name, as well as an elaborate index by subjects, convenient for finding optional methods when the analyst must handle materials with which he has not previously worked.



Institutional Marketing

MARKETING. By Edward A. Duddy and David A. Reuzan. McGraw-Hill Book Co., 330 W. 42nd St., New York 18, N. Y., 1947. 675 pages; 6¼ x 9¼ in.; cloth. Price, $4.50.

Subtitling their book "an institutional approach," the authors here have made a conscious effort to avoid the confusion by which books of this type are frequently hampered. They regard the essential characteristics of the institutional point of view to be the functional activity, the structural organization and the coordinating forces. Thus, such phases of marketing as management and price determination are not isolated subjects, but are seen in their proper focus as coordinating forces.

In fact, the whole effort in this quite comprehensive treatise has been to approach the marketing structure as an organic whole, made up of interrelated parts. The whole and the parts are subject to growth and change in a process of distribution that is coordinated by economic and social forces.

It is not an easy book to digest, but it is well worth the effort.

Biochemical Report

ANNUAL REVIEW OF BIOCHEMISTRY. Vol. XVI. Edited by J. M. Luck in association with H. S. Loring and G. Mackinney. Published by Annual Reviews, Inc., Stanford University P. O. Calif., 1947. 740 pages; 6¼x9 in.; cloth. Price $6.

Once again the advances in many fields of biochemistry are brought up to date. Presenting monographs on the developments in active research since the subject last appeared on the title page, this volume holds its usual quota of valuable material for the food technologist.

Papers of particular interest in

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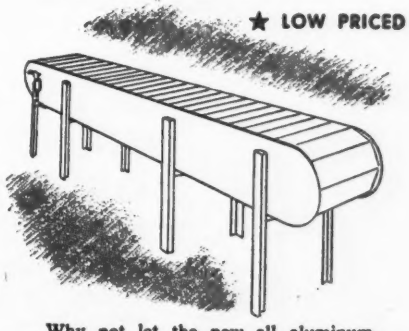

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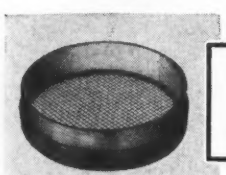

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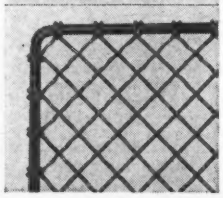

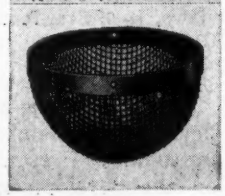

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the widely diversified food field include those on antioxidants, proteolytic enzymes, and the chemistry and proteins of amino acids. The latter two are particularly notable in view of the general interest in protein hydrolysates. Other papers discuss fat and water soluble vitamins, folic acid, composition and metabolism of other basic food constituents, and such newer studies as fundamental aspects of isotopes in biochemical research.

In general, more than half the titles are of direct interest to the food technologist and nutritionist in this latest review on subjects that border on many fields.

GOVERNMENT PUBLICATIONS

The following recently issued documents are available, at the prices indicated, from the superintendent of Documents, Government Printing Office, Washington 25, D. C. When no price is indicated the pamphlet is free and should be ordered from the Bureau responsible for its issue.

GUARANTEED WAGE OR EMPLOYMENT PLANS. Bureau of Labor Statistics, Bulletin No. 906. Price 15 cents.

ECONOMIC ANALYSIS OF GUARANTEED WAGES. Bureau of Labor Statistics, Bulletin No. 907. Price 25 cents.

LABOR LAWS AND THEIR ADMINISTRATION, 1946. Proceedings of the Twenty-Ninth Convention of the International Association of Government Labor Officials, Milwaukee. Division of Labor Standards, Bulletin No. 88. Price 40 cents.

STATE AND REGIONAL MARKET INDICATORS, 1939-1945. Department of Commerce, Economic Series No. 60. Price 20 cents. Market appraisal data.

SCIENCE AND PUBLIC POLICY. Volume 1, A Program for the Nation. The President's Scientific Research Board. Price 20 cents.

DISCUSSION OF INDUSTRIAL ACCIDENTS AND DISEASES. 1946 Convention of the International Association of Industrial Accident Boards and Commissions, Portland, Oregon. Division of Labor Standards, Bulletin 87. Price 35 cents.

PARTIAL LIST OF REFERENCES ON PROCESSED CHEESE. Bureau of Dairy Industry, BDIM-Inf-51. Processed.

LATE BLIGHT OF TOMATOES. U. S. Department of Agriculture, AIS-63. Printed leaflet.

PATENTS

Pectin Precipitated From Solution by Addition of Calcium Carbonate and Aluminum Chloride and Boiling—H. T. Leo and C. C. Taylor, Anaheim, Calif. No. 2,425,947. August 19, 1947.

Dried Sugar Beet Pieces Coated With Minute Sugar Crystals While Submerged in Supersaturated Sugar Solution—A. M. Zenzes, New York, N. Y. No. 2,426,076. Aug. 19, 1947.

Rendered Crude Fish Liver Oil Dissolved in Organic Solvent, Stabilized by Heating in Contact With Concentrated Ammonium Hydroxide; Oil Separated From Ammonia Water and Solvent by Heating Under Reduced Pressure—L. O. Buxton, Newark, and C. E. Dryden, East Orange, N. J., to Nopco Chemical Co., Harrison, N. J. No. 2,426,485. Aug. 26, 1947.

Fatty Material Stabilized by Mixing With Vegetable Meal in Presence of Small Quantity of Ammonia—L. O. Buxton, Newark and C. E. Dryden, East Orange, N. J., to Nopco Chemical Co., Harrison, N. J. No. 2,426,486. Aug. 26, 1947.

Heated Chocolate Liquor Centrifuged to Remove Gritty Constitutents And Give Treated Liquors of Predetermined Cocoa-Butter Content — W. T. Jones, New York, N. Y., to Rockwood & Co., Brooklyn, N. Y. No. 2,426,616. Sept. 2, 1947.

Cellulose Converted Into Sugar by Acid Hydrolysis Supplemented by Mixing Grinding Pressure Action—E. I. Fulmer, Ames, Iowa, J. W. Dunning, Abilene and R. H. Fash, Fort Worth, Tex., to Anderson, Clayton & Co., Houston, Tex. No. 2,426,677. Sept. 2, 1947.

Bread Improver Made to Consist of Sodium, Potassium, Ammonium or Calcium Chlorite, Ammonium Sulfate and Edible Carrier Inert to Chlorites—W. S. Hutchinson, St. Paul and R. I. Derby, Minneapolis, Minn., to The Mathieson Alkali Works, Inc., New York, N. Y. No. 2,426,736. Sept. 2, 1947.

Incompatible Vitamins Put Into Single Product by Adding One to Hydrogenated Vegetable Oil With Relatively Low Melting Point, Adding Another to Hydrogenated Vegetable Oil With Higher Melting Point and Mixing at Temperature Intermediate to Melting Points of Oils—M. Chanin, Bronx, N. Y., to Scientific Nutrition Corp., New York, N. Y. No. 2,426,762. Sept. 2, 1947.

Coconut Meats Shelled, Grated and Crushed Preliminary to Mixing of 10 Parts of Strained, Homogenized Creamy Juice With Nine Parts Sucrose to Give Product Containing Approximately 50 Percent Total Solids—Ramon Lopez-Irizzary, San Juan, Puerto Rico. No. 2,426,834. Sept. 2, 1947.

Sausage Stuffer Equipped With Double-Walled Horn Permitting Movement Into Plurality of Positions and Providing for Removal of Air in Case ing During Stuffing Operation—J. E. Dyrek and W. L. McCaslin to Armour and Company, Chicago, Ill. No. 2,427,202. Sept. 9, 1947.

Wheat Gluten Heat Treated to Destroy Adhesive Property Preliminary to Forming Into Granules and Drying During Counter Flow With Hot, Dry Air—C. V. Hagedon to Huron Milling Co., Inc., Harbor Beach, Mich. No. 2,427,276. Sept. 9, 1947.

Foods Dehydrated in Atmosphere of Recirculated, Water-Washed, Heated CO_2—Gustave Reich, Philadelphia, Pa. No. 2,427,302. Sept. 9, 1947.

Beverages in Translucent Containers Electronically Inspected for Presence of Foreign Particles—Paul Weathers, Upper Darby, Pa., to Radio Corporation of America. No. 2,427,319. Sept. 9, 1947.

Mash Liquor Fermented With Lactic Acid Bacteria to Make Acidified Malt—T. R. Dixon, Pampisford, England, to Enzymic Malt Co., Ltd., Ipswich, Suffolk, Eng. No. 2,427,323. Sept. 9, 1947. 1947.

Cold Water Dispensible Waxy Cereal Starch Given Water Absorption Power in Excess of 10 Parts by Weight by Pregelatinizing With Warm Water and Drying—H. H. Schopmeyer and G. E. Felton, Hammond, Ind., to American Maize-Products Co. No. 2,427,328. Sept. 9, 1947.

Mixture of Crude Sugar Syrup, Finely Ground Vegetable Material and Fat-Soluble Vitamin-Containing Material Dehydrated by Mixing With Unslaked Lime—A. E. Briod, Short Hills, and L. O. Buxton, Newark, N. J., to Nopco Chemical Co., Harrison, N. J. No. 2,427,520. Sept. 16, 1947.

Cereal Starch Made into Thin Spreading Adhesive—C. C. Kesler and D. Rankin, to Penick & Ford, Ltd., Inc., Cedar Rapids, Iowa. No. 2,427,562. Sept. 16, 1947.

Gelling or Thickening Properties of Foods Improved by Use of Irish Moss, Edible Potassium or Ammonium Salt Complex—A. Frieden, New Rochelle, and S. J. Werbin, New York, N. Y., to Stein, Hall & Co., Inc., New York, N. Y. No. 2,427,594. Sept. 16, 1947.

Food Packed in Container Made to Have Insect-Proof Lamination — Hans W. Vahlteich, Edgewater, N. J., to Best Foods, Inc., New York, N. Y. No. 2,427,647. Sept. 16, 1947.

Egg Yolks and Whites Freed from Reducing Sugar by Fermentation Preparatory to Drying—E. W. Hopkins, Hinsdale, Ill., G. Josh, Crown Point, Ind., and L. A. Harriman, Chicago, Ill., to Armour & Co., Chicago, Ill. No. 2,427,726. Sept. 23, 1947.

Horse Bean Proteins Recovered by Selective Precipitation from Acidified Water Dispersion—F. A. Beique, Outremont, Quebec, Canada. No. 2,427,760. Sept. 23, 1947.

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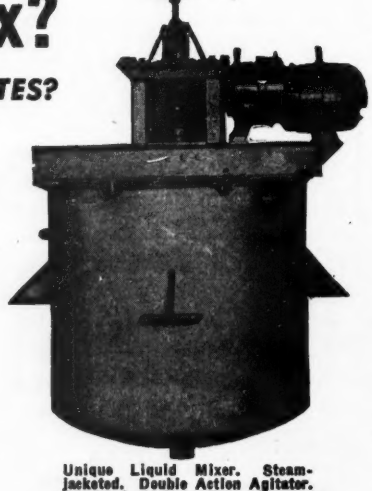

Unique Liquid Mixer. Steam-jacketed. Double Action Agitator. Gearhead Motor. One of many types.

Robinson specializes also in the manufacture of Cutters, Grinders, Attrition Mills, Hammer Mills, Sifters. Save and be served. Write for descriptive literature.

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Plant: Muncy, Pa.

SALES REPRESENTATIVE

MERCER-ROBINSON COMPANY, INC.

30 CHURCH ST., NEW YORK 7, N. Y.

Chief Editor

(*Continued from page* 101)

Francisco for four years, will transfer to the editorial offices in New York to assist in the editorial direction of the magazine and in the launching of the 1948 editorial plans.

The retiring editor was recently the guest of honor at a luncheon in the McGraw-Hill dining rooms, when Publisher Williamson wished him good luck in his new activities, and presented him with a brief bag and pocket notebook from his friends on the staff. In accepting the gifts, "Larry" indicated that, in addition to his new duties, he planned to have additional time for his personal affairs, including his farm at Newtown, Connecticut, which he acquired last year.

—End—

Farmer Hearing

(*Continued from page* 85)

were put, however, were obviously unprepared for such a broadside and their replies were inconclusive.

If any conclusion on price support had to be drawn from the Lancaster meeting alone, it would probably be that the farmers would settle for a floor high enough to insure production costs, but not so high as to encourage production surpluses or to distort prices as in the case of potatoes recently. This would be in line with Secretary Anderson's proposal for reduced subsidies, but in sharp contrast to the demands of the southern farmers, who want no change.

Soil Conservation

While subsidies provided the most debatable topic at Lancaster, the growers appeared to be far more seriously concerned over soil conservation. On this topic all were, of course, in agreement although testimony on procedure differed considerably. One witness, for instance, thought that 95 percent of the farmers were not now employing conservation measures. Another, from the same organization, admitted in answer to a question from the Republican side of the committee, that farmers would probably continue conservation practices even if government help were withdrawn.

An example of what the farmer is up against in his soil conservation efforts was inadvertently provided by Rep. Chester Gross, Penn-

sylvania Republican committee member. He spoke caustically of seeing chicken manure piled high in New England. The poultry farmer disclosed that he could not get farmers to haul away this valuable fertilizer. At the same time these same farmers were accepting fertilizer from the government. His comment boomeranged a moment later, when a witness pointed out that the same thing was happening in many other areas. The cost of phosphate and other fertilizers delivered, he explained, was considerably below the high cost of hauling the chicken manure—when it was possible to get the help to haul anything.

Organization Spokesmen

There was general agreement on the observation that any reduced acreage, imposed by federal controls, should be required to be planted in soil conservation crops and not in crops that would compete with the crops of other farmers. But on this and other topics, touching on farm economics, it was the farm organization, rather than the individual farmer, who offered the testimony, generally from prepared statements. And in this phase, the fruit, vegetable and milk processor and the fresh fruit and vegetable distributor did not escape unscathed.

From these hearings and from those held in Washington earlier, the committee has a mass of evidence, even though much of it may be conflicting. The long range legislation that the committee will propose to Congress, as a result, is of vital interest to the entire U. S. economy.

—End—

Instant Mashed Potatoes

(*Continued from page* 89)

tato skins and eyes come off easily; trim table operations are eliminated and the lost potato pulp is salvaged in the slurry process.

In this slurry process, the peels and adhering pulp are collected in a 2 percent brine. The use of brine is necessary to inhibit cell rupture. The mixture of peel and brine enters an agitator where the potato pulp is churned into a slurry, from which the peel is screened out and discarded. A vibrating stainless steel screen of 16 or 18 mesh performs this readily. The pulp is then allowed to settle from solution in a stainless steel or galvanized settling tank, and returned to the

faster cleaning

For STAINLESS STEEL EQUIPMENT

If quick cleaning is one of the factors that determines your use of stainless steel processing equipment, remember this:
A STAINLESS STEEL VESSEL WITH ROUND CORNERS CLEANS FASTER—MORE THOROUGHLY—THAN ONE WITH *SQUARE* CORNERS. Whether you clean with brush or cloth—you can "get at" all the surfaces of a round-cornered vessel easily. There are no corners in which residue can hide.

Having worked exclusively with stainless steel and alloys for many years, we have developed to a high degree the techniques needed to fabricate processing equipment with round corners.

Using tools and dies of our own design, we build your vessels so that cleaning time in your plant is cut to a minimum. Result: your stainless steel equipment costs less to operate and lasts longer. Consult with us.

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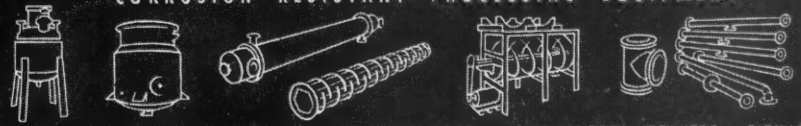

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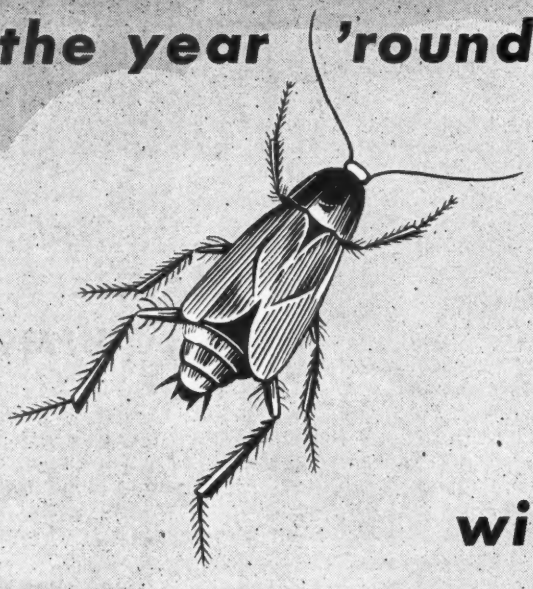

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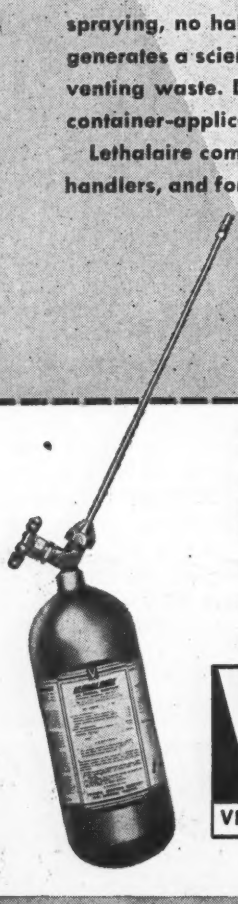

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VIRGINIA Chemicals

WEST NORFOLK, NEW YORK, BOSTON, DETROIT

process for centrifuging, granulating and final drying.

Costs

This process offers a simple, practical means for producing a unique, market-appealing product, combined with cheap production costs capable of meeting even fresh market competition.

Capital investment for a plant designed to produce 4,000,000 lb. of Instant mashed potato granules per year (1,000 lb. per hr.) is estimated at $70,000 for plant equipment installed, plus housing.

Production cost estimates have been carefully made from extensive, actual experience of former dehydrators—interpolated in Table I for this process—and present-day conditions. The greatest variable is the raw material cost, which we have arbitrarily set at $0.75 per 100 lb.

Total packaging cost, both material and labor, has been separated because of its natural variation for different consumer packs. Adding the cost of sales to this production cost would indicate that a retail selling price of $0.25 per dry pound is possible. The equivalent raw weight of potatoes depends somewhat on the type of consumer use, but in general can be considered as seven pounds to one. In other words, the mashed potato would retail at $0.25 per seven pounds potatoes (equivalent raw weight).

Reconstituting

Ready-to-serve, fluffy, mashed potatoes can be prepared instantaneously. Directions consist simply of adding the granules to boiling liquid, 1 part granules to 2½ parts liquid (by volume). The liquid can be either all water, or all milk, or any combination of the two, depending upon individual taste and delicacy desired. Reconstitution is immediate and the product is ready to serve.

Any such commercial product must of necessity be foolproof. Few people read directions with any care, and all cooks follow their own methods. This product meets that requirement. The recipe itself is simple; there is no possible way for lumps to form; water temperatures need not be measured to avoid danger of pastiness from boiling temperatures used, and the cook has freedom to vary the consistency by adding either more liquid or more potato granules. If too dry, pour in some water—too thin, more potato! Thus its "foolproofness" is practically assured consumerwise.

The product has flavor and gen-

eral palatability comparable with fresh mashed potatoes, and its shelf life is pronounced for even rigid conditions. Losses in water soluble nutrients are, however, indicated to be severe. These losses have not been determined, nor have they been compared to the normal losses incurred in other processes, and therefore cannot be confirmed or interpreted here. This Instant mashed potato is now ready for commercial production—a commercial market food offering opportunities for widespread volume manufacture and distribution.

—End—

Chem Show

(*Continued from page* 111)

ed by Ingersoll-Rand Co., New York. New types of ejector jets and a model of a water vapor refrigeration unit will be displayed.

A full size cut-out animated model of the Type G packingless self-priming centrifugal pump, illustrating how the effective seal against atmospheric pressure is accomplished by the liquid being pumped; and, because no packing is used, how a contamination free product is assured, will be shown by The La Bour Co., Inc., Elkhart, Ind.

Other Equipment

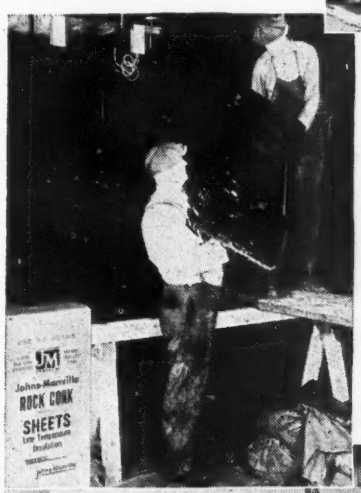
A plastic, transparent model of a new automatic backwash rapid sand filter for raw water treatment will be displayed by The Hardinge Co., Inc., York, Pa. This equipment, which uses coagulants and a small area thin sand filter bed with a porous plate taking the place of the gravel layer, is suitable for pharmaceutical and food processing plants.

An operating collector, constructed with a transparent shell properly illuminated to demonstrate the principles involved in the Schneible multi-wash collectors for removing industrial dusts, fumes or vapors, will be exhibited by the Claude B. Schneible Co., Detroit, Mich.

As the spotlighted focus of attention at the booth of the Pulverizing Machinery Co., Summit, N. J., a Micro-Collector will be used to demonstrate certain new principles in the art of dust collection. It represents the first commercially successful application of hard-pressed wool felt as a filter medium for air and gas. A cylindrical bag of this material is kept perpetually clean by means of a hollow annular blow ring which hugs and flexes the

The *Right Insulation* correctly applied *Never Grows Old*

Select the Right Insulation: Any insulation will save *some* money—but only the right insulation, correctly applied, will save the *most* money for the longest period of time. Because of its many advantages, leading refrigerating engineers have long relied on J-M Rock Cork Insulation for refrigeration service.



Get Correct Application: No insulation is better than the man who installs it. That's why every J-M Insulation Application Unit employs only skilled mechanics . . . each one thoroughly trained in all phases of up-to-date application methods.

25 Years Young! J-M Rock Cork Insulation was used back in 1922 to insulate this cold storage room of the Flora Produce Company, Flora, Ind. Because the job was *engineered right* and *applied right,* it is still providing dependable insulation, still saving money by guarding against spoilage.

J-M engineers can plan the same efficient, long-lasting insulating job for *you.* For details write Johns-Manville, Box 290, New York 16, N. Y.

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ROCK CORK

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CONTINUOUS
POTATO CHIP
MACHINE

is completely automatic! Automatic from raw, unpeeled potatoes to finished product. Peeling, slicing, washing, drying, frying and salting . . . all are under perfect control. You can't beat a Ferry Potato Chip Machine.

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bag while moving up and down its outer surface by means of conventional chain and sprocket drive. In the unit on display, the bag is centered in a metal cabinet with a Lucite window in the front panel so visitors can see the internal operation of the machine.

Filtration Engineers, Inc., Newark, N. J., will exhibit a pilot plant filter and a new line of synthetic filter fabrics.

F. R. Hormann & Co., Inc., Brooklyn, N. Y., will exhibit industrial and laboratory filters for liquids, sterilizing filters and asbestos filter pads.

Falstrom Co., Passaic, N. J., will exhibit a knocked-down cubicle for housing control instruments. Fabricated in standard sections 6 ft. 9 in. high x 24 in. wide x 12 or 30 in. deep, with or without door, the cubicle is easily transported and quickly assembled in the field. Fabricated to permit adding multiple units.

Heil Process Equipment Corp., Cleveland, Ohio, will exhibit Heilex No. 445, a rubbery, tough material which when applied in substantial thicknesses resists abrasion and rough handling. Standard 30 and 55 gal. steel drums lined with Heilex No. 445 will be displayed.

A new material called Haveg "48," which will soon be available in the form of pipe and fillings, will be exhibited by Haveg Corp., Newark, Del.

Magnus, Mabee & Reynard, Inc., N. Y., will show a wide number of essential oils, flavors and perfuming materials. They will also have an exhibit of botanical plants with a progressive showing of the oils derived from them and finally the end use of the oils as indicated by products in which they are used.

—End—

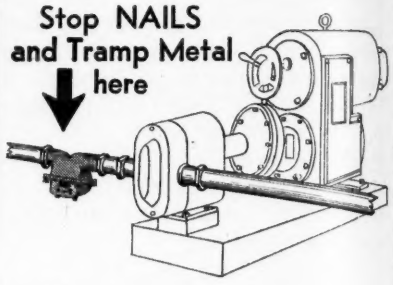
Dairy Industry

(*Continued from page* 97)

A feature of the convention was the collegiate students' international contest in judging dairy products. The contest attracted 20 teams from colleges and universities throughout this country. Undergraduate teams from colleges having dairy technology courses competed with one another and with a panel of expert tasters, in determining the quality and flavor of dairy products. Winners were the members of the University of Connecticut team: Donald Martin, Evelyn H. Fish, Alan F. Tobie and Jules J. Starolitz. The team,

Save
Your Pump

Stop NAILS
and Tramp Metal
here



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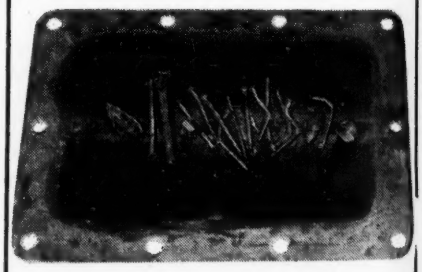
"CESCO"
MAGNETIC TRAP

A single bent nail may cost you hundreds of dollars if it gets into your pump. Add up the cost of part replacements, mechanics' time, lost production, lost labor, shrinkage and spoilage. A broken pump can run into money fast!

Many food processors tell us that they have more than repaid the cost of a "CESCO" Magnetic Trap in a single season . . . through trapping nails and tramp metal ahead of the pump.



Here is an actual photographic reproduction showing one day's trouble shooting with "CESCO" Equipment in one cannery.

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coached by Leonard Dowd, took home the four silver cups presented to high scoring teams in the four products—ice cream, butter, milk and cheese — as well as the "All Products" cup, which carries with it the right to choose a member of the team to receive the $850 graduate fellowship in dairy research granted by DISA.

Theodore Brunner of the Iowa State College team won gold cups for ice cream and all products judging. Richard Huckins of the Michigan State College team was the best milk judge, and Charles M. Betterton of the Mississippi State team of cheese.

Officers Re-Elected

As it is customary for officers of the IAICM to serve two terms, the officers elected at Atlantic City last October were unanimously re-elected. They are: Benjamin C. Brown, Brown's Velvet Ice Cream Co., New Orleans, president; G. Stanley McKenzie, head of Creameries of America, Los Angeles, vice-president; Claude Parcell, Farmers Creamery Co., Fredericksburg, Va., treasurer; O'Neal M. Johnson of the IAICM staff, assistant treasurer; and Robert C. Hibben, executive secretary.

—End—

Prepackaging Meats

(*Continued from page* 104)

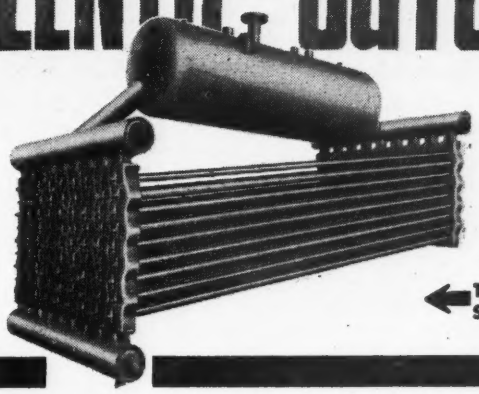
the stores or at a central warehouse, mechanized on a low-cost basis. If the operation is to be conducted in a central warehouse, tests must be made with standardized meat cuts so that they can be allocated according to neighborhood preference. For example, cheaper cuts can be heavily stocked in low income neighborhoods, while the more expensive cuts can be stocked in higher income areas. Consequently, it might be possible to eliminate the need to merchandise slow-moving items at a loss in either area.

Tests can also be made to determine the extent decorative packaging will promote sales. A few green peas tossed into a package of veal or lamb patties may not only enhance the package, but also increase sales. So will a sprig of parsley placed on top of a beef steak.

Use of colored cardboard trays for steaks, livers, kidneys and poultry-in-parts should be investigated. There may be an advantage in using yellow trays for poultry-in-parts and red trays for livers, kidneys and other moist red meats. Blood

Steamaster Builds Boilers with

PLENTY OF GUTS!



The GUTS of the Steamaster Boiler

IF YOU

designed and built your own boiler you'd make sure it had

PLENTY of GUTS

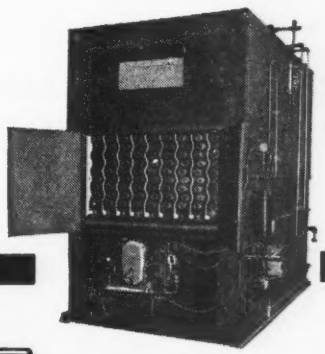
Water Tube Design
Inclined Tubes
Sectional
Steel Headers
Longitudinal Drum

CHECK *the features you'd include if you designed your own boiler*

- ☐ Water Tube Design
- ☐ Inclined Tubes
- ☐ Sectional Steel Headers
- ☐ Longitudinal Drum
- ☐ All Steel Construction
- ☐ Positive Tidal Circulation of Water—maintains all parts at equal temperature.
- ☐ Condensate Return System Built-in as an integral part of all boilers of 60 h.p. and up.
- ☐ Easy Inspection and Maintenance—every tube immediately accessible. Just open the heavily insulated access doors.
- ☐ Large Combustion Area . . . Three-Pass Heat Baffling gives high thermal efficiency.
- ☐ Choice of Fuel—Gass, Oil or Coal or any combination of these fuels to meet fuel requirements of your plant.
- ☐ Fully Equipped for Automatic Operation—with the finest accessories. As nearly automatic as a boiler can be.
- ☐ A.S.M.E. CODE—National Board Approved. Inspected and certified by Hartford Steam Boiler Inspection and Insurance Co.
- ☐ Full Range of Sizes from 10 h.p. to 300 h.p. as illustrated. The Model A for 3½ h.p., 5 h.p. and 7½ h.p.
- ☐ Can Be Fired Over Rated Capacity and still maintain high thermal efficiency.

these features . . .

which you'd have in your own boiler design are built in all Steamaster Boilers from 10 horsepower to 300 horsepower. Fabricated entirely in our own factory.



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AUTOMATIC BOILER CO.
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Sales and and Service in all principal cities.

COMPLETELY SHOP ASSEMBLED

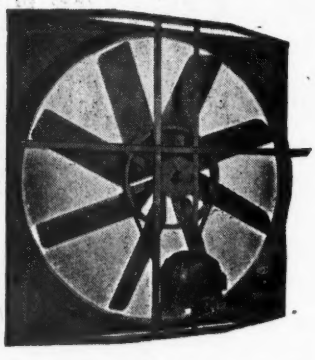
Power Engineers Agree: STEAMASTER is the Boiler with PLENTY OF GUTS!

Develop NEW EFFICIENCY

WITH

Coolair
TRADE MARK

EXHAUST FANS



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BREEZE CONDITIONING, by Coolair, is the *scientific* way of removing stale air and providing the benefits of healthful *fresh* air in your plant. Precision-built Coolair Exhaust Fans are available in many sizes, making possible at tailored-to-fit installation in large or small buildings.

COOLAIR DEALERS, trained under factory supervision, are equipped with precise knowledge in planning and installing these fans. Investigate *now* by calling in your Authorized Coolair Dealer for a FREE survey. There is no obligation.

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GAS BURNER NOZZLES

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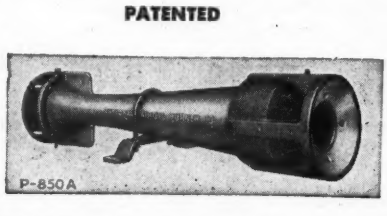

PREVENT OVERHEATING AND BURNING OF CASTINGS . . .

Recessed facing of refractory insulating plastic protects nozzle from extreme heat and prolongs nozzle life.

For detailed information about these long-life nozzles, write for Supplement 3 to Bulletin 55.

and insure stable ignition over a long, trouble-free life. Renewable type recessed gas tips direct the separate igniter flames against the main volume of the mixture to insure stable ignition . . . and allow greater turndown without burnback.

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INDUSTRIAL OIL BURNERS, GAS BURNERS, FURNACE EQUIPMENT

dripping from livers, for example, blend with red-colored trays, preventing the unsightly blood-spotted appearance commonly found with the use of white trays. Colored trays must not be used, however, to give a misleading impression regarding quality or character of meat contained therein.

Prepackaging in Stores

Retail store prepackaging operations are essentially the same as those at a central warehouse. Meats are cut, weighed, labeled, wrapped and put in self-service cases. These operations may be conducted in a back room, basement, or behind the self-service cases.

At Grand Union's Hempstead, Long Island, store, for example, the following are the prepackaging operations:

1. A supervisor, in charge of all operations except cutting, submits an order to the cutting department, requesting kinds and quantity of meat cuts for the packaging department.

2. Immediately upon receipt of the order, butchers or cutters in the store's cutting department, fill the order. Steaks, chops and roasts are cut; ground beef, stew meat and patties are prepared from trimmings; poultry is eviscerated and cut-up and luncheon meats are sliced by machine. Meat cuts are then placed in enamel trays and delivered to the weighing and wrapping department by electric elevator.

3. Weighing, labeling and wrapping are done behind the self-service counter. Two girls weigh and record the amount of meat received from the cutting department. Girls then weigh cuts into retail size units and mark the weight, price per lb. and total cost on coded labels stamped with the identity of the meat cut (top sirloin steak, lamb loin chops or veal rib chops).

Four girls wrap the cuts and and place them on a 30 ft. x 1 ft. endless belt conveyer which carries them to wire baskets. Packages are then placed in self-service cases. The packaging department is equipped with sheets of transparent material 10 in. x 10 in., 12 in. x 12 in., 15 in. x 15 in. and 20 in. x 20 in. and an 18-in. roll.

4. A supervisor services the case with pre-packaged meats, keeps it full and orderly at all times, rotates stock, checks the temperature of the case and replaces torn and broken sealed packages and discolored meat.

A slip of paper, identifying the meat cuts, is placed on each tray. Only a limited amount of meat is sent up to the wrapping department. This eliminates the possibility of merchandise accumulating at the wrapping department for any length of time without refrigeration.

At the Grand Union store a 33-ft. self-service case is divided into the following sections: (a) Pork, 3 ft.; (b) beef, 8 ft.; (c) lamb, 4 ft.; (d) veal, 3 ft.; (e) poultry, 4 ft.; (f) luncheon meats, 4 ft.; (g) variety meats, 2 ft., and (h) smoked and cured meats, 5 ft.

Consumer Packaging

Methods of prepackaging consumer meats vary. Flat meats such as chops and steaks can be: (1) Wrapped in transparent material alone or (2) placed on waxed cardboard backing or trays to provide rigidity and insulation while heat sealing the overwrap.

Moist meats, such as ground beef, sliced liver, sweetbreads and kidneys must be protected against leakage. They should be packed in waxed paperboard boats or cups, provided with a transparent window using some transparent material. Packages may be sealed either by heat sealing, tieing with cord or sealing with a transparent adhesive cellulose tape.

—End—

Brew Masters

(*Continued from page* 119)

brought to the show a 10-ton combination beer filler, gasser and crowner and their postwar Superkleen bottle washer, while the Heil Co. displayed their Spray-O-Merse pasteurizer which incorporates all the advantages of spray-type and immersion type pasteurizers in one compact unit.

Pure Culture Apparatus

The Schwartz Laboratories, pioneers in advancing the art of brewing through research in biology and chemistry and founded in 1880, demonstrated their latest type of pure yeast culture apparatus made entirely of stainless steel and boasting of simplified piping, valves and connections.

Three technical sessions were devoted to materials improvement, practical brewing problems and public relations. At the first session A. E. Ladish, Ladish Malting Co., Milwaukee, Wis., reviewed the present barley situation. Of the 263,350,000 bu. of barley grown in the United States in 1946 only about 60 percent (average) moves to market and only part of this is suitable for malting and brewing. Present malting capacity is about 100,000,000 bu., 80 percent of which is diverted for brewing, 10 percent for distilling and foods, and 10 per-

CONVEYORIZE with Farquhar

save handling costs . . .

Freight-handling costs less when Farquhar Conveyors work for you. They move material *fast* and efficiently, cut man-hours to a minimum. Four types to fit your needs.

LITTLE HELPER—Model 434

Versatile model for package and bag handling, car and truck loading, "boosting" in a conveyor line. Length: 10 feet. Belt: 12 inches.

FLEXIMOUNT—Model 435

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cent for export. In recent years barley production in the seven midwestern states has receded and unfavorable weather conditions not only caused decreased yields per acre, but affected the quality of the barley as well. Through the efforts of industry supported organizations, such as the Malt Research Institute and the Midwest Barley Improvement Association, this trend has been reversed in 1947 when for the first time an increase in barley acreage was effected.

Improved corn products used as brewing adjuncts were described by Dr. E. R. Darling, Technical Director, Lauhoff Grain Company, Danville, Ill. New varieties of corn are bringing about changes in the constituents and properties of adjuncts made from them, such as higher water solubles, increase in the soluble nitrogen, not of protein character, etc. Much research is needed to gain a better understanding of the enzymatic hydrolysis of the proteins derived from corn flakes and grits in the mash, and other phases of brewing, involving corn nitrogen, and the effect of the oil content in corn adjuncts on the taste, foam and keeping quality of beer. The Dry Corn Milling Industry is carrying on an impressive sanitation program in order to be able to guarantee the purity of their products. Hops were discussed from the grower's point of view by Deal H. Walker.

Novel Program

In the technical session an unusual procedure was followed in order to assure the selection of subjects of interest to the members. That this was achieved was attested to by the attendance of over 1000 members. Eighty-two questions dealing with actual production problems had been submitted by the local districts of the association to E. T. Vogel, chairman of the technical committee. These were printed and distributed at the session where they were discussed by a panel of brewing technologists and from the floor. These questions covered practically all phases of brewing, from raw materials to cleaning of equipment and packages, and the answers reflected actual brewing experience. The discussion revealed that there is a right and a wrong way of carrying out most operations and that the effectiveness depends largely on prevailing conditions and the end results desired.

Headquarters for the Master Brewers' Association are to be transferred from New York to Chi-

cago and the next annual meeting is scheduled for Boston. Albert E. Wesp, Buffalo, was elected president, Edward W. Huber, Milwaukee, first-president, Francis N. Ward, Toronto, second vice-president, E. E. Neschke, New York, third vice-president and Joseph S. Pickett, Chicago, treasurer.

—End—

Better Floors

(*Continued from page* 123)

possibly mechanically stronger.

The table of physical properties of resin and sulphur cements will be found of interest. The figures given are safe minimums. Especially note the low absorption figures—less than 1/25th of that of Portland cement.

From the above figures it will be seen that a mechanically stronger floor will result with the use of a sulphur or resin cement than could be expected with the common Portland cement mixtures. When this fact is taken in conjunction with the great chemical resistance of these two types, it becomes evident that for permanency, floors of this type should be carefully considered in any food plant in which a high percentage of liquids is used.

—End—

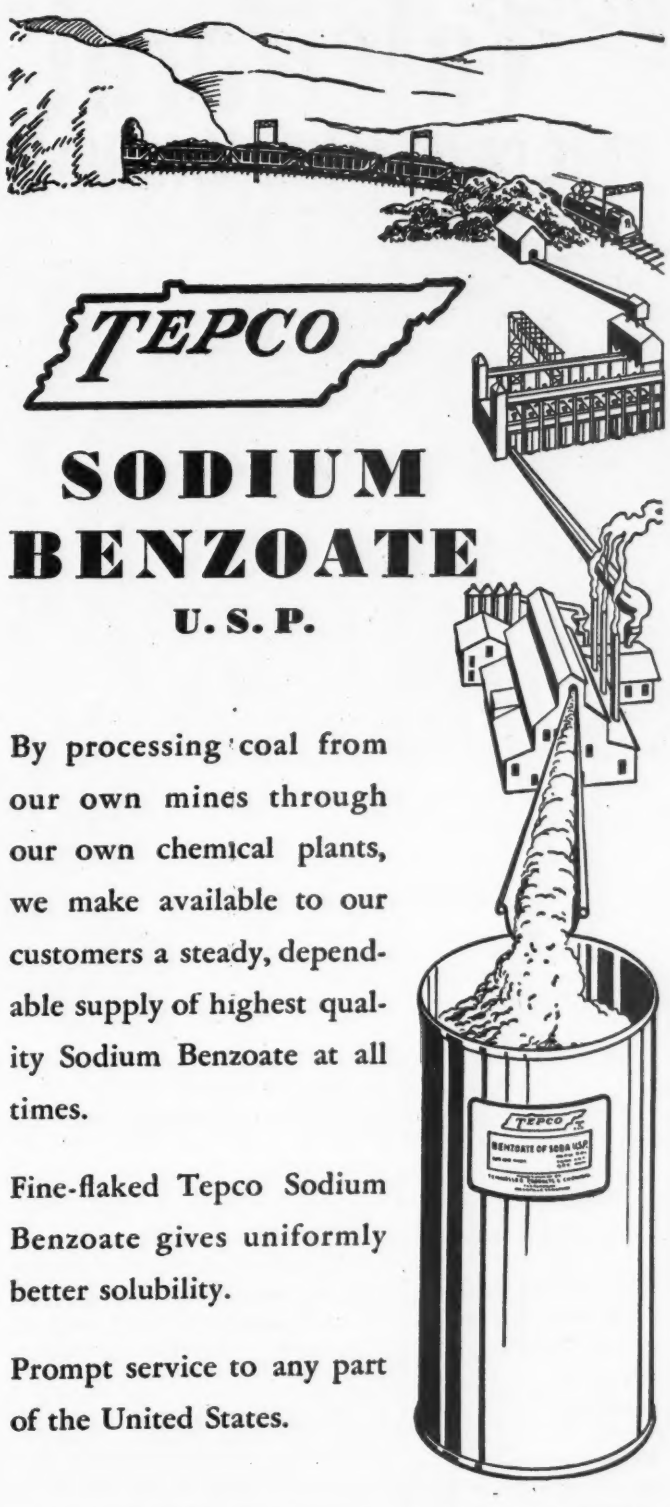
Impact Milling

(*Continued from page* 94)

The impact machine (Type B), which employed two sets of stationary impactors, reduced the wheat as much in one operation as did the standard impact grinder in two operations. The desired reduction is therefore best accomplished by such changes in the working parts of the machine, since the rate of feed has been shown to have very little effect upon the amount of reduction.

Performance of Impact Machines In the Break System

In judging the performance of the impact grinder in the break system it is essential to study the physical characteristics of the reduced material. The classification of the ground material is accomplished by sieves and air currents and depends on difference in particle size, shape and density. Evaluation of a grinding process must therefore take into account particle size distribution and the shape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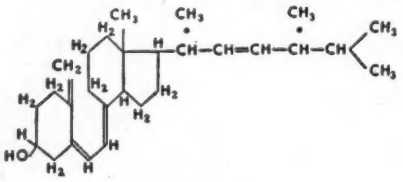

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of the particle. These factors directly influence the quality of the product.

In the present work the classification system was fairly constant, and only a few changes were made in the scalp sieves in the break sifters normally used in roll grinding. The sifting and classification system was essentially that designed for material reduced by rolls, and therefore it is not known what further improvement in the products from impact grinding could have been effected had this important factor also been studied.

Effect on Physical Characteristics. The standard impact machines, operating two in series, reduced the bran more than did the rolls. This resulted in smaller pieces and greater quantities of bran in the sizings, middlings, and flour separations. On the other hand, the impact machines did not reduce the endosperm as much as did the rolls. As a result, large portions of endosperm were carried over to the tail of the break system. This is undesirable because material from the tail of the break system usually goes to streams of inferior quality. A series of photographs were taken of the different separations produced by rolls and impact grinders.

The action of the first break rolls on wheat is shown in 1. The photograph shows the scalp stock from the first break rolls. The bran coat appears to be torn apart and the endosperm fractured into small pieces. The result of the action of impact machines is shown in 2. There is little fracture of the endosperm, while the bran appears rounded, indicating that the endosperm has been freed from the bran coat by a blow or impact. The appearance of the sizing, middlings and flour produced by employing the conventional rolls and by impact machines was about the same. Generally speaking, however, the fractions produced by an impact break system contained more bran fragments than the conventional break system.

Appearance of Bran

The bran obtained from break rolls is shown in 3. It is evident that the bran is flattened and that the endosperm has been removed by a scraping action. Bran obtained from impact machines is shown in 4. Here the bran is rounded and the endosperm is still attached to a great extent. There appears to be insufficient separation of the endosperm from the bran by this method.

Increased extraction was produced by the use of type A and B impact machines in series with the standard impact machine. Type B and the standard machine were used in the first operation and type A and the standard machine were used in the second break operation. Type A machine was employed in the third break operation while two standard impact machines were used in the fourth break operation. The bran was reduced to about the same extent as before and more endosperm reduction was obtained. The bran produced by this combination of impact machines is shown in 5 and is shell-like in appearance, with some endosperm still attached to the bran.

To obtain a better balanced mill and to remove most of the endosperm before the fourth break operations, rolls were used in the third and fourth break operations. The bran obtained from this combination of impact machines and rolls in the break system is shown in 6. There appears to be a small amount of endosperm attached to the bran. Some of the flat pieces of bran have been cut and scraped by rolls, but the shell-shaped pieces of bran appear to be the products of impact action.

It would be desirable to remove the free bran from the system after each reduction, but in present milling methods, bran remains in the system and is subjected continually to grinding action. This could account for the presence of the small bran fragments.

Effects of Impact Grinding on Product Quality. Whenever impact machines were employed in the break system, a break flour high in ash was obtained. This also caused a straight grade flour to be slightly higher in ash. This indicates that more fine bran fragments are produced by impact machines than by roll and that the usual separation system used for roll grinding does remove them.

There was no important difference in the protein content of flours produced by the two methods. The baking quality of the flours from either method was similar.

The impact machine excelled the rolls in germ removal. Crude fat analysis indicated flour produced by using impact machines in the break system contained less fat than flour produced by the normal process. The impact action evidently freed the germ in larger portions than did roll grinding and, consequently, the germ was classified into fractions of large size and was scalped

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off into the brown sizings and tailings stocks. This is a distinct advantage over the conventional process.

Conclusions

The experimental work has shown that several factors affect the reduction of the material. The type of material will affect the amount of reduction obtained. The amount of reduction varies inversely with the moisture content, but length of tempering time has little effect. The design of the working parts of the machine affects the reduction of the material. An increase in the amount of reduction obtained by a grinder does not necessarily make it a better machine, since the reduction must also be accomplished in a manner which will facilitate the separation and classification of the reduced material. The use of impact machines in the break system complicated the separation and classification problem. The classification equipment used in these experiments was not adapted to impact grinding, thus fine bran particles were distributed throughout the separation. This resulted in flour of higher ash when impact machines were employed in the break system.

The action of the impact machines released more whole germ as indicated in an increase of crude fat content of the brown sizings stream. The flour produced when using impact machines in the break system was lower in fat content, indicating more germ removal.

The baking quality of flour produced using impact machines in the break system compared favorably with that observed with break rolls.

Recommendations

In view of the present work the following recommendations are made for the most efficient use of these impact machines in the break system:

1. The wheat should be tempered to approximately 17 percent moisture content. This will result in less fracture of the bran coat and is helpful in releasing the germ.
2. The clean bran fragments should be taken out of the system after each operation. It is desirable to remove the bran as soon as it has been freed of endosperm.
3. The classification of middlings must be more efficient than can be obtained in the separation system of a conventional mill. The middlings that contain bran fragments should be separated into different fraction sizes, which can be

cleaned by employing the principle of the difference in the physical shape of bran tissue and endosperm chunks. Thus, the bran fragments could be removed before the middlings are reduced to flour.

4. The break flour must be kept at a minimum. The break flour could be cleaned by the use of air to remove bran fragments which differ from the flour particles in size, shape and density.

An impact machine, to be used efficiently, should be provided with a means of varying the amount of reduction. Thus, the amount of reduction in a single operation could be controlled to obtain the most efficient processing of the material. In the break system this would mean the reduction would be set to obtain a maximum of coarse middlings, and a minimum of break flour without excessive breaking of the bran. Different mill stocks vary in their grinding requirements for satisfactory reduction.

It is possible that a number of the impacts received by the material as it passes through a multistage grinder do not break the material but cause only bruising, fracture or chipping of the bran coat. This action would tend to produce fine bran fragments.

It appears that the single stage impact grinder would be the most efficient machine since, if a machine produced a single impact with sufficient force to yield the required reduction, less energy would be wasted and fewer bran fragments would be produced.

The authors wish to thank the Entoleter Division of The Safety Car Heating and Lighting Company, Inc., New Haven, Conn., for equipment and financial assistance which made this work possible. Our thanks are also due to Mr. Donald C. Abbott for assistance with the chemical analyses.

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1. Peter A. Kozmin, Flour Milling. George Routledge & Sons, Ltd., London, 1921.
2. Arthur N. Hibbs, J. A. Shellenberger and R. O. Pence, in press, The Theory of Impact Grinding. Transactions American Association of Cereal Chemists.

CORRECTION

On page 90 of the November issue of FOOD INDUSTRIES there is illustrated a piece of equipment at work in the field which is described as a portable bean cleaner. This description is incorrect. The equipment shown is a spinach harvester loader of type which has been in use for a number of years. The illustration was used to bring out the value of mechanical methods in assuring quality frozen foods, in the article by E. E. Todd.

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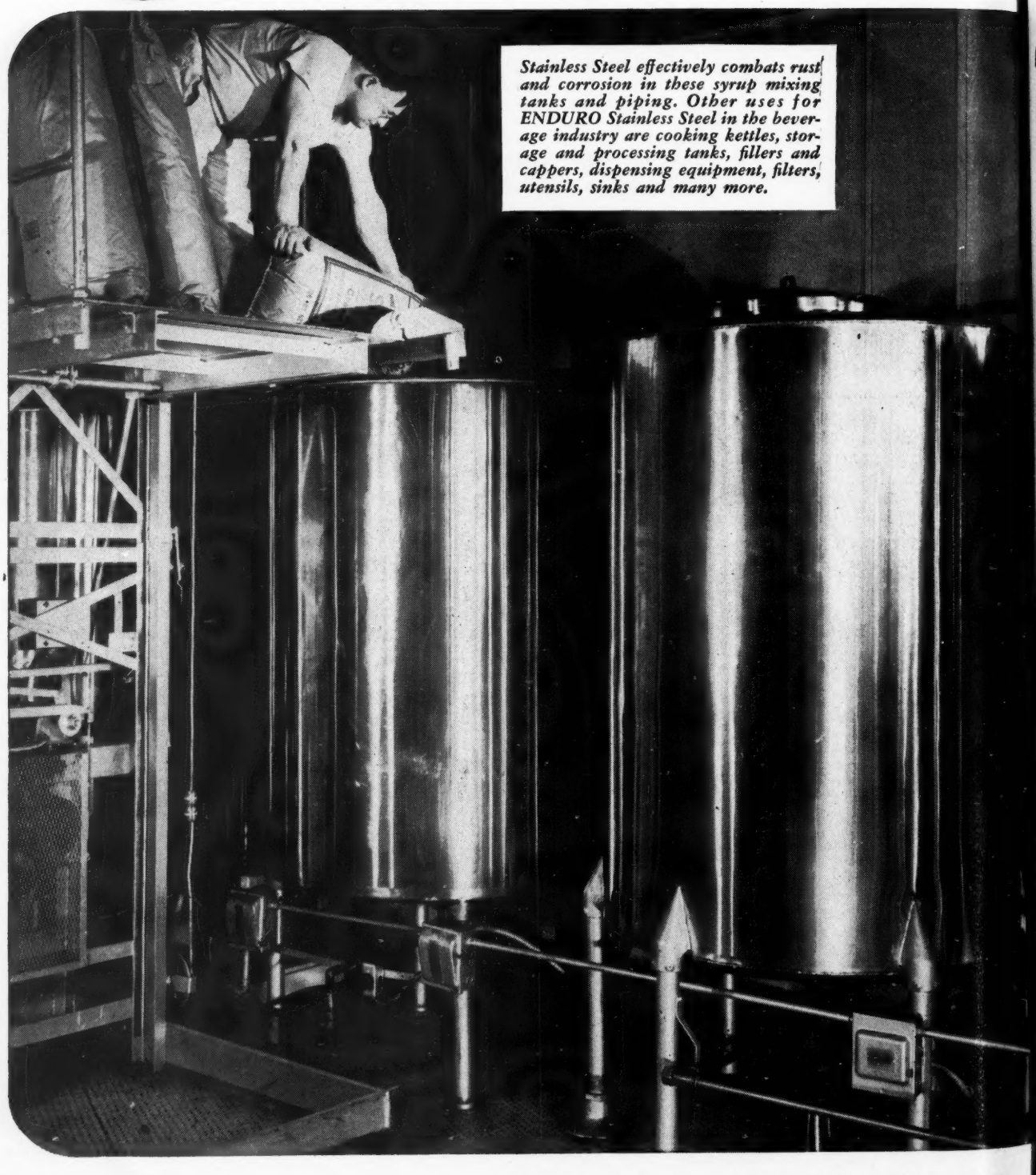


Stainless Steel effectively combats rust and corrosion in these syrup mixing tanks and piping. Other uses for ENDURO Stainless Steel in the beverage industry are cooking kettles, storage and processing tanks, fillers and cappers, dispensing equipment, filters, utensils, sinks and many more.

OUR TEACHERS—

They Need The Help Of Business Now

THIS is an appeal to raise school teachers salaries—fast. Such appeals are commonly addressed, rather vaguely, to the conscience of the community. This one is not. It is addressed directly to the business community, and to its hard core of common sense.

As a whole, the school teachers of the nation are taking an economic beating. So, too, are their close associates and co-workers, the librarians. In purchasing power, public school teachers salaries, after taxes, average about 20 percent less than they did eight years ago. Beginning salaries of librarians, always low, have fallen behind an equal amount in purchasing power. College and university teachers are not much better off. The pressure is particularly heavy on those in the lower ranks. As a group, teachers and librarians are close to the bottom of the economic heap.

Unless this situation is remedied promptly, it is confidently to be expected that:

1. The more competent teachers will continue to desert our schools in droves, and our libraries will remain inadequately staffed. More than 350,000 teachers — many of them the very able ones—have left the public school teaching staff of about 900,000 in the last six years. More than 100,000 of the replacements are "substandard." They cannot meet the minimum educational requirements of their jobs which, by admission of the profession itself, are none too high.

2. Those who remain will be organized increasingly into economic pressure groups. Teachers strikes and the rapid growth of unionism among teachers at present clearly indicate what is in store.

Many business men are so deeply disturbed by the resort to the strike weapon by some teachers to enforce their salary demands that their sympathy for the general plight of our teachers tends to be dulled. Such an attitude is understandable. It avails nothing, however, in eliminating the crisis in education caused largely by teachers salary troubles.

The crisis in education is a crisis for the nation as a whole. The work of our schools, colleges and libraries is such that its deterioration means deterioration of the nation. However, the salary crisis in education is in special measure a crisis for the business community. That community has a special stake in having a well-educated and well-disposed constituency.

Education and Unionism

There may be room for disagreement as to whether teachers should organize themselves in trade unions, and follow trade union tactics. However, there is no conceivable room for disagreement as to whether organization of teachers into a fighting economic pressure group under the lash of a teachers salary crisis would be a body blow to business. Among many teachers it would foster an abiding hostility to the institution of business which, occupying a key position in the life of the community, had not done its utmost to make such unionization unnecessary by taking a lead in relieving the teachers salary crisis.

In our work of publishing technical periodicals and text books, we at McGraw-Hill meet and come to know many teachers and librarians. We know that, as a group, they have little appetite for participation in militant economic pressure groups. They are far more interested in making a militant assault on ignorance and prejudice through concentration on their professional work. If, through neglect of their economic needs by the business community, they feel forced to resort to trade union organization and tactics, the teachers and librarians can be expected to have an abiding re-

sentment toward the institution of business. That resentment will, in turn, be communicated in no small measure to the coming generation. Such is the nature of the educational process.

The crisis in education is not, of course, exclusively a matter of salaries. Unsatisfactory working conditions also play a part. Many schools are dilapidated and terribly overcrowded. So are some libraries. Some small-town school boards oppressively insist that the school teachers be the paragons of piety the board members wish they were themselves. Protection of a proper degree of academic freedom is sometimes missing. The teacher is rarely accorded a prestige comparable to the importance of the job. Elements such as these aggravate the crisis in education. But the first and absolutely essential step toward surmounting the crisis is to provide tolerable salaries.

Because of the enormous diversity of local conditions affecting teachers and librarians salaries, no general rule for emergency action would fit all cases. From state to state, average yearly expenditures on education in 1940 varied all the way from about $30 per pupil to about $150. Some states, like Nebraska, finance their schools almost exclusively from local taxes. Others, like Delaware, rely almost entirely on state taxes. Some states and communities have already acted to meet the salary crisis. Others have not. Variations such as these limit any generalization.

Guide for Emergency Action

But as a general proposition it can be safely said that the minimum requirements of the emergency will not have been met so long as the salaries of class room teachers and junior members of college faculties and library staffs have not been increased by the amount necessary to keep them abreast of the increase of about 50 percent in the cost of living since 1939. In many cases, a temporary cost of living adjustment might prove the best way to handle the problem.

This suggestion, let it be repeated, is not offered as a solution of the salary problem, but as a start. With their salaries increased enough to meet the increased cost of living, the teaching and library groups as a whole would still have cause to envy the current economic position of industrial workers. Since 1939, the average of weekly earnings of industrial workers after taxes, has outstripped the rise in the cost of living by about 21 percent.

However, a start and an absolutely essential start would be made toward giving America the sort of educational system it must have not only to fulfill its ideals but holds its own in this highly competitive world. We worry, and I think rightly, about having the free world engulfed by Russian Communism. According to the best figures available, the U.S.S.R. is spending about twice as large a share of its total national income for education as we are. The figures compared include our expenditures for both public and private education. That comparison is really something to worry about.

States Should Take Lead

In dealing with the salary crisis it is up to the teachers to display a maturity and integrity worthy of their profession. Teachers have many employment advantages, such as long vacations. They should not slur them over in making comparisons of their annual incomes. Also employment in teaching and libraries has been notably stable. Teachers and librarians should not ignore that fact in comparing their position with those whose employment has been far less steady.

At the same time, the great fiscal difficulties involved in solving the crisis in teachers and librarians salaries must not be used as an excuse for postponing effective action. The states are better equipped financially and otherwise to take such action than is the federal government and, with the localities directly involved, should take the lead. If the price of effective action is a heavier tax burden for communities already too heavily burdened that price must be paid. The crisis presents a major emergency. To handle it as anything less is to court irreparable damage to the nation as a whole, and a special measure of damage to business as well. The intelligent self-interest of business requires that it leave nothing undone to meet and master the crisis in education.

President McGraw-Hill Publishing Company, Inc.

YOUR CHANCES OF GETTING AHEAD

FOR 20 years we have been whittling away the foundations of our economic structure. We have been cutting away the incentives to "get ahead in the world," to increase production and to improve efficiency. Unless this process is reversed soon, we risk the sort of industrial stagnation that currently afflicts Great Britain so disastrously.

How far the whittling has gone is shown by the statement in the center of the page. It shows that everyone's stake in working harder and getting ahead has been reduced sharply since 1929. In that year, anyone who was even moderately successful could look forward to reaping the rewards of his success. If he earned $5,300 annually over a period of 25 years he could retire on a comfortable income of $3,000 per year. Or he could pile up enough capital to go into business for himself. He could fulfill the American dream as phrased by Abraham Lincoln in his first annual message to Congress in 1861:

"The prudent, penniless beginner in the world, labors for wages awhile, saves a surplus with which to buy tools or land for himself, then labors on his own account another while, and at length hires another new beginner to help him. This is the just and generous and prosperous system, which opens the way to all, gives hope to all, and consequent energy and progress, and improvement of condition to all."

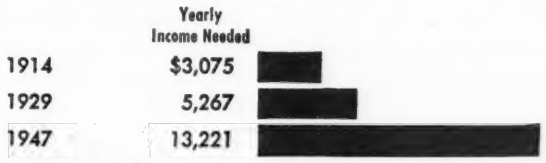
Look at the situation today. To retire on an annual income from investment that will buy as much as $3,000 did in 1929, a young man needs to earn over $13,000 a year for 25 years. That's more than 2½ times the income he would have needed in 1929. The same thing is true of acquiring a stake in a business.

YOUR CHANCES OF GETTING AHEAD

To see how your chances of getting on in the world have changed during the past few decades, the McGraw-Hill Department of Economics has calculated how much it now takes to save enough to acquire a retirement income or a comparable stake in a business, as compared to what it took in 1914 and 1929.

The objective set is an income from investment equal to $3,000 a year in 1929 dollars. It is assumed that the savings required to yield this income are made over a period of twenty-five years. During that period it is also assumed that $4,000 per year (in 1929 dollars) is spent on living expenses.*

Here is how the figures work out:



It now takes more than four times as large an annual income as it did in 1914 to gain a comparable stake. It takes well over twice as much as it did in 1929.

Changes in three factors — federal income taxes, living costs, and interest rates — explain why the income needed has multiplied so. Here's how these factors line up for the three years.

	Federal Income Taxes Married Man, 2 dependents		Cost of Living (Index Numbers 1935-39)	Interest Rate High-grade Corporate Bonds
	$5,000 income	$10,000 income		
1914	$10	$60	71.8	5%
1929	$3	$40	122.5	5%
1947	$589	$1,862	155.0	2½%

Similar calculations show that if we could reduce federal expenditures from $35 billion to $25 billion annually, raise interest rates by one-tenth and lower living costs by 15% — all realistic possibilities if we make the effort — then the income needed to build up such a retirement fund would come down to $9,500. The chances of realizing that goal would then be restored to what they were in 1929.

*Several other factors were omitted from the calculations because they would not have a decisive effect on the results. Thus, existence of social security pensions and retirement funds now reduces the income needed; but if state income taxes were added, the income needed would increase.

Why Try to Succeed?

While the income needed for retirement today has increased 2½ times — or by more than 150% — since 1929, the average person's income has increased only 80%. So the average man's chances of achieving success are really slimmer now than a generation ago.

This 1929-47 trend is something new in America. The average person's chances of getting ahead improved during 1914-29. In that period the dollar income needed for retirement or a stake in business rose by 75%, but the average income rose by 100%. So more people were within striking distance of success and security in 1929 than in 1914. The story has been different since 1929.

Fewer people actually do achieve financial success today. Only 1% of all families now have incomes large enough to build up a retirement fund or a stake in business. In 1929 almost 6% of all families attained a comparable degree of success.

Higher taxes are the most important reason why it takes so much more now to build up a competence. They account for one-half the increase in the amount needed. The other half is explained by higher living costs and lower interest rates.

It is, of course, true that few people ever get into the higher income brackets. So the process of cutting

away the incentives which play such a key role in our economic system affects comparatively few people immediately. It does, however, have a powerful indirect effect on all of us.

Everybody Loses

When half to four-fifths of any additional income of successful people goes to Uncle Sam a heavy drag is obviously put on doing the work to get it. Thus, we stand to lose the benefit of full use of the nation's best brains. By so doing we stifle industrial progress. And the loss in productive efficiency far outweighs the tax revenue the Treasury gains. Carried far enough, the process of stifling economic progress by slashing rewards leads straight to industrial stagnation.

The same process also multiplies the risks of embarking on new capital investment. High taxes rule out all but the most profitable new projects and restrict most expansions to boom times when profits are high. So capital investment follows a boom and bust pattern and, by so doing, contributes much to ups and downs in production and employment.

The Sorry Plight of Britain

The case of Britain today provides an object lesson of how blighted incentives produce industrial stagnation. *Britain's number one economic problem is to get more production. But the tax load there is so heavy it stifles the incentive to produce more.*

A coal miner who works an extra shift pays about a third of his added earnings to the tax collector. And, as the London *Economist* comments, tax rates on business executives are so high that they kill every incentive except that to tax evasion. In short, not only is the incentive to succeed blighted, but so is the incentive to work.

A root-cause of Britain's trouble is this: The cost of an expensive program of social benefits has been piled on top of the heavy costs of paying for past wars and trying to prevent future wars. Tax rates are boosted accordingly. What her experience proves is that the attempt to provide excessive social benefits may defeat itself. It raises the tax burden on rich and poor alike and smothers the incentive to work. So the underlying basis of all economic benefits—production—is eaten away.

We in the U. S. haven't traveled as far down the stagnation road as Britain has. Taxes amount to about 26% of national income here as against about 45% there. But, unless we start soon to build up incentives to do better work, instead of whittling them away as we have been doing, we will catch up with Britain fast.

It's Late but Not Too Late

Can anything be done? Decidedly yes, *particularly by tax reform and reduction in the cost of living.* As far as interest rates are concerned, any large increase would raise excessively the cost of carrying our war-swollen national debt, and hence raise taxes. But some increase in what are now excessively low interest rates may well be both feasible and desirable.

Action on the tax front is the first order of business. Our jerry-built tax structure is the thing that is chiefly responsible for cutting the incentives to work harder. Two things are important: 1) Government spending must be pared to the bone; 2) The tax system must be completely overhauled to remove the shackles on all-out production.

The 56th editorial in this series, published in March, outlined major steps that need to be taken in remodeling federal taxes in order to increase incentives to individual and business enterprise. *The revenue bill now before Congress is no more than a short step in the right direction. Much more must be done to clear the way for high production and rising living standards.*

Lifting the blight which taxes now place on incentives would help cut the high cost of living. It would stimulate greater production and greater efficiency. But a further step is necessary. Part of the benefits of improved efficiency must be passed on to consumers in the form of lower prices.

In the past few years we have been following precisely the opposite course. In many cases wages have been increased all out of proportion to increased productivity. Result—soaring prices and a severe squeeze of the consumer, to which some greedy exploitation of war-created shortages has also contributed.

To Give Ability a Chance

Our basic and most crucial problem is to get back on the track which leads to higher production and improved living standards all along the line. We got off that track in the 30's. Then, we started scrambling for larger slices of the same pie instead of trying to produce a larger pie. Now the process of getting back on the track is greatly complicated by the tremendous tax burden growing out of the war.

Yet it's not too late to turn back from the road that leads to industrial stagnation. As the statement in the center of the page shows, we could restore the odds of getting ahead to what they were in 1929. Cutting the federal budget to $25 billion a year and putting the tax structure in good order are the crucial first steps.

By taking these steps soon, Congress can go far to restore the incentives to hard work and efficiency which have been so largely washed away in the past 20 years. If they are not taken the American dream of getting ahead by hard and effective work will exist only in the history books, and our children will inherit from us an economic order without opportunity, without hope, without individual liberty.

President McGraw-Hill Publishing Company, Inc.

THIS IS THE 59TH OF A SERIES

THE RUHR—
VALLEY OF DECISION

FOR AMERICANS and for American business the most important single spot on earth today is the Ruhr Valley of Germany—a valley no bigger in area than the State of Rhode Island. Upon recovery in the Ruhr hinges recovery in Europe. Upon recovery in Europe hinges the peace of the world.

No machine can run with its most important part missing. Western Europe without the Ruhr is a dead machine. Before the war, over half the coal and steel produced in the Western part of Continental Europe came from this one little valley. Today, the fact is that no other region in Europe has the technical skills and enterprise to produce the industrial supplies which Europe must have if it is to help itself back to a self-supporting economy. And, after observing Europe for many weeks, I am convinced that no one but the United States can successfully supervise the rebuilding of the Ruhr.

If you will keep four considerations in mind, as the international politicians gamble, you can easily tell whether the United States is playing its proper role in the rehabilitation of the Ruhr. Here are the four considerations:

I. We are paying for the Ruhr rehabilitation (or the lack of it).

II. We alone have the skill and enterprise to supervise its rebuilding.

III. It will be a tough organizing job requiring money, hard work, and outright sacrifice on the part of management men and technicians.

IV. We had better do it well if we love our children.

I

We are paying for rebuilding the Ruhr—or we soon shall be. The British now control the Ruhr, its government and its industry. They have been paying out about four hundred million dollars—American dollars—a year to buy the food, raw materials and equipment needed to rebuild the Ruhr. The British must spend American dollars for these supplies because the supplies can not be bought anywhere but in America. Thus far the British have, in effect, obtained the dollars which they spend for the Ruhr by drawing them out of the $3,750,000,000 loan which we granted Britain last year.

Now the loan is fast running out. The British lack dollars and other assets. We must take over, directly or indirectly, the dollar expenditures for rebuilding the Ruhr. We shall pay for it. Therefore—

II

We should supervise it. The British have been running the Ruhr's industry. They might conceivably suggest to Washington that they continue to run it while we pay the bill. *That we should never agree to.* There is a sound old rule that he who pays the piper shall call the tune.

Perhaps we would not need to invoke that rule if the British had done a good job reviving the industries of the Ruhr. *They have done a poor job—physically and ideologically.*

The physical output of the coal mines and steel mills of the Ruhr in recent months was actually smaller than at the first of the year. Production of coal amounts to little more than half of the pre-war 127 million tons per year. Steel productions limps along at one-sixth of the pre-war rate—far below the volume permitted even under the present low level-of-industry plan for Germany.

Ideologically, the British Labor Government has tried to export to Germany the brand of socialism which is making such a dubious record at home. Foreign Minister Bevin—although he may now have misgivings about it—committed himself to nationalization of the Ruhr's coal and steel industries. British representatives have pushed hard to get General Lucius Clay, our able military governor in Berlin, to agree to socialization of the Ruhr. So far, he has resisted this pressure, but our State and War Departments and we as individuals must back him up to the limit if he is to continue to combat this pressure successfully.

Even if the British government were not socialist, there would be good reason for questioning the ability of Britain to rehabilitate the industries of the Ruhr. In recent generations, the British management class has shown itself more

interested in cartels, restricting output, and allocating markets, than in full-steam, ingenious enterprising production.

Certainly the British must remain full partners in the *political* administration of Germany. No one suggests anything else. However, their recent production record demands turning the job of revitalizing the Ruhr industries over to the nation which is paying the bill and which leads the world in production.

If we have any faith in the business philosophy by which we have lived and prospered for 170 years, we should demonstrate that that philosophy still is dynamic by taking up the burden of the Ruhr.

III

It will be a tough job. It will require men and supplies and money from the United States. It can not possibly be done in less than five years. A list of some of the necessary steps shows how hard it will be.

A. Plans for socializing the Ruhr should be shelved quickly. The industries there should remain in trusteeship for five years. Then the Germans themselves should decide their ownership; let us hope that by that time we can demonstrate to them that private ownership and private initiative mean high production, good distribution and high wages.

B. The top supervising management jobs—both the top policy and the top technical jobs—required outstanding business ability. That is why American business men must be willing to go to Germany, sacrificing comfort and leisure, and even income, if necessary.

C. Germans should take over the management job at the operating level. The Germans are good technicians. They have a greater incentive than anyone else for getting the Ruhr back in working order. That incentive should be harnessed.

D. Special effort should earn special rewards. There is nothing wrong with the Ruhr (or the rest of Europe) that hard work will not cure. Before a man will work hard, he must feel that his work will advance him and his family. That simple motive, which powers our whole economy, must be revived in the Ruhr. To revive it requires enormous ingenuity and work . . . a new currency . . . a logical customs union . . . a sensible ration system . . . enough food, clothing, housing and consumer goods so that the worker can buy something with his currency and his ration points.

E. America will have to furnish a good share of these foodstuffs and supplies. Certain key items of equipment also will be needed. Only as we succeed in our job can this flow be diminished.

F. A sensible priorities system must channel Ruhr coal and steel into those uses which, in turn, will further increase output. Repair parts for railroad cars should stand high on the list. Housing, coal equipment and machine tool parts should come ahead of the automobiles and permanent steel bridges which at times have been accorded preference.

German technical management of industry in the Ruhr—point C above—need not mean *political* control of the Ruhr by some future sovereign German state. As the French know, the Ruhr, next to the atomic bomb, is the most dangerous weapon in the world. It is the arsenal without which no European power, even Russia, would dare start a war. There is no sense in turning that arsenal back to the *political* control of a nation which twice in 25 years used it for aggression. (And three times since 1870.) Surely we have enough resourcefulness to let the Germans who live in the Ruhr run the industries there without turning political control over to a central Prussian state.

This partial list shows how much hard work and statesmanship the United States must put into the Ruhr. But—

IV

We had better do it if we love our children. If we do not do this job—if we should pull out of Germany or fail there—we leave behind us a vacuum which neither Britain or France has the strength or ability to fill. Russia has the will and, if left unopposed, the power to fill that vacuum. Therefore, the day we fail or the day we pull out of Germany, the third world war takes a long step closer to us and certainly to our children. What greater incentive does any American need to work for than our success in this field?

If we succeed, the western zones of Germany in conjunction with Belgium and Holland can become self-supporting in three to five years. That way lies recovery for all Europe. That way lies peace for the world. That way lies vindication for the American business system in which we believe—the system of competitive private enterprise, with freedom for the individual and his initiative.

President McGraw-Hill Publishing Company, Inc.

THIS IS THE 60TH OF A SERIES

WHILE WE DELAY—

Russia Drives for the Atlantic

IN THE STRUGGLE to keep western Europe west of the Iron Curtain it is later than you think. Unless the United States quickly mobilizes its own and other nations' resources, World War II will be lost as World War I was lost—by no economic follow-through.

Millions of people in western Europe, living in cold homes or no homes at all, face another winter of near starvation. Some countries are absolutely without dollars to buy abroad the food and fuel they need for survival. Others slide toward that desperate state.

In this welter of misery Russia grasps for dominion over all Europe. Everywhere, as cold and hunger deepen and as men begin to doubt America's determination to help, Russia turns on the pressure. In France the Communists drive to overthrow the Government. In Italy they do likewise. In Greece Russia kills the United Nations investigating commission. In Trieste Tito elbows us out of the way. In Germany and Austria the Soviet commanders alternately stymie and flout the Allied governments.

FACED WITH this bloodless attack, the leaders of western Europe and of the United States have not covered themselves with glory.

Look, for example, at what the sixteen European countries participating in the Paris meetings on the Marshall "plan" first proposed to the United States as a catalog of their needs. In the main it was simply an adding up—to $30 billion—of what the various countries thought they needed to keep going in the same old way at the same old stands. There was no real start on plans for the mutual aid by European states which is the essence of a successful recovery program . . . no real start on plans to knock down the barriers which divide European trade into hopelessly inadequate little pockets . . . no real plans to clean up currencies which deteriorate so fast nobody wants to work for them. *In fact no plans to make people want to work.*

Meanwhile, what have our leaders offered? Not much more than one fine commencement speech by General Marshall, outlining a good idea, and a couple of carloads of statistics, with more to come.

Not even a beginning has been made on the most crucial part of any European aid program—*that of explaining to the American people what their part must be and why.* It is true that not all the reports of all the statistical committees have been completed. They never will be. But it is also true that the broad outlines of what the United States must do to save Europe are already clear. And it is not simply to provide more dollars, although $12 to $16 billion more—the cost of 6 or 8 weeks fighting in World War II—may be required.

A far more basic requirement is leadership which will lift Europe out of the slough of despair and get recovery rolling. Without that leadership more billions for Europe will buy us nothing but more bitterness and remorse on both sides of the Atlantic.

WHAT ARE the ingredients of that leadership? Here are a few:

1. A bi-partisan program for European recovery.

It should be so thoroughly understood and so overwhelmingly supported by both parties that playing politics with it will be like selling military secrets to the enemy.

Truman and Vandenberg have failed miserably to develop and explain a complete program—one in which Europe and America can have full confidence. Nor have Taft and Dewey and other candidates for high office pledged that politics will stop at our shoreline. These men must speak out. To date Herbert Hoover alone has had the courage and vision to state a program.

2. A mobilization of American food supplies.

We must assure people at home and abroad that our crops, cut down by drought and heat, will be stretched to cover minimum European needs (with whatever help we can muster from other nations) without forcing still higher food prices here.

Some food experts are comfortably confident that the stretching can be done. But

meatless and wheatless days, higher extraction of flour from wheat and similar voluntary conservation moves would make it surer. And they would demonstrate that a free country can mobilize itself to meet a very serious crisis.

3. An understanding that relief is one problem and recovery another.

Both problems must be solved. Relief emergencies must be met, some of them at once. But they must not black out the longer task of recovery. Italy illustrates the point. Italy, particularly the south, is flat broke. Help is needed right now to keep people from dying in the streets. But we must eventually do more than keep the Italian people alive. We must help them get back to useful work so that they can stand on their own feet.

4. A steady insistence on results—which means that Europe must find a way to make its people want to work.

In the U.S.S.R. they have a way to get things done. It is to liquidate those who do not work. In the U.S.A. we have a way to get things done. It is to create incentives to make people want to work. Western Europe, notably France and Britain, has fallen between two stools. It has socialized away the incentives, and it does not yet, thank heaven, enslave the laggards. We should make it crystal clear that we have no designs on the national "sovereignty" of others. But we should make it equally clear that we insist that those countries which receive our aid work hard enough to get results. To this end continued aid should be on an installment plan, each installment conditional on getting results. Otherwise more billions can easily disappear down the drain.

5. Insistence on all-out self-aid by European countries.

That is the constructive core of the Marshall idea—to help Europe to help itself. In his brilliant "Report on Germany" and how to get it "off the backs of the American taxpayer," Lewis H. Brown, Johns-Manville Chairman, shows how the export of only 10 million tons of coal a year from Britain to western Europe would speed industrial recovery of the Ruhr immeasurably. There are countless other cases where effort in one European country—or a group of countries—will break a big industrial bottleneck in another. We should insist that everything possible be done to see they are broken.

6. An agreement with Britain and France giving us authority in western Germany equal to our responsibility.

Britain is shifting to us most of the financial burden she has been carrying in the German occupation. Less directly we shall also be carrying much of the French occupation load too. We must have authority in the economic field commensurate with our responsibilities. Otherwise the management of western Germany can poison Anglo-American and Anglo-French relations in addition to wasting resources we could use to promote general European recovery.

It is truly said in the scriptures that the Lord loveth a cheerful giver. But it is not recorded anywhere that anyone, including the recipient, loves a soft-headed giver. Hence as a capstone any program of aid for Europe should have machinery assuring that only what is needed is sent; that what is sent does the job for which it is sent; and that arrangements are made for the recipients to pay back whatever they can.

THE AMERICAN PEOPLE should be told clearly by their leaders that there is no assurance that the best possible program of economic aid for Europe will do the job. The time is very late.

In France and Italy, as our help falters, the Communists right now are provoking strikes which will make the people's suffering more acute. They hope, of course, to overthrow the governments in both those countries and to seize control. If Communist dictatorships are clamped on France and Italy this fall, Russia and her satellites will have advanced to the Atlantic. The Iron Curtain will have moved 500 miles west—toward us.

Americans should be clearly told, therefore, that not to undertake an immediate program for the recovery of Europe is to bring closer the greatest possible national disaster—World War III.

President, McGraw-Hill Publishing Company, Inc.

THIS IS THE 61st OF A SERIES

TAFT-HARTLEY ACT

Frees "Slave" Labor

THE TAFT-HARTLEY ACT is two months old. Its full meaning is yet to be determined by decisions of the National Labor Relations Board and the courts. However, on its face, the Act refutes the attacks made upon it by union leaders as hysterical and fanciful.

Management has had every provocation to reply to these attacks in kind. To the credit of the employers of this country, they have not succumbed to that temptation. They have maintained a temperate attitude toward the new law and the problems it is designed to correct. This approach is right. But it is only an approach.

Union leaders will want to settle for nothing short of *repeal.* Their attack on the Act has made some headway. It may be more effective as time goes on. *Certainly the Taft-Hartley law will be repealed if management just sits tight and lets union leaders continue to confuse their followers.*

Management, therefore, must implement its present temperate attitude with a program of positive action. The Taft-Hartley Act must be made to work not because management wants it, but because it is fair to labor — and management can do things right now to see that the Act works. Management can:

I. Utilize every means at its disposal to acquaint the rank and file of union workers with the truth about the Taft-Hartley Act.

II. Suggest amendments to the Act if experience indicates that amendments are necessary.

III. Use the law as little as possible in settling labor disputes.

IV. Stand firm in its refusal to bargain away the rights accorded by the Act to workers, management, and the public.

An examination of those four *must's* will show why they provide management with its best program of action.

I.

Union members do not know what the Taft-Hartley Act provides.

There is abundant proof of that statement.

While Congress was still trying to write a law that the President would not veto, FACTORY magazine asked workers how they felt about major proposals in the pending House and Senate bills. Overwhelmingly they felt good. They were in favor of almost every individual provision that was finally incorporated into the bill and passed over the President's veto.

The same story emerged from the national opinion poll made by the Opinion Research Corporation of Princeton, N. J. and published by Look magazine after the law was enacted. It showed that union members uniformly favored major provisions of the Act, but were strongly opposed to the Act itself.

This inconsistency is easily explained. Instead of telling their members what the Act does for them, most union leaders have been condemning it as "a slave labor law" because it curtails the leaders' power and recognizes the rights of the union member and the public.

It is not a slave labor law. All of the basic rights accorded to labor by the Wagner Act of 1935 are preserved by the Taft-Hartley law. All of the unfair labor practices that were forbidden by the Wagner Act are still forbidden by the Taft-Hartley Act.

Nothing in the law impairs labor's right to bargain through representatives of its own choosing.

The Wagner Act condemned as an unfair labor practice any effort by employers to coerce employees in the selection of their bargaining representatives. So does the new law.

The Taft-Hartley Act merely recognizes rights of individual employees, of management, and of the public that were ignored by the Wagner Act.

For example, while the Taft-Hartley Act continues the workers' protection from coercion by employers, it also gives them new protection against coercion by unions. The individual worker is freed from the necessity of joining a union to *get* a job. He may still be required to join a union to *keep* his job, but not unless a majority of the workers vote for such a requirement in a government-supervised election.

Some people think the Taft-Hartley Act is weak in protecting the rights of the individual worker. They think that membership in a union should never be made a condition for holding a job. This is true. However, the Act does restore to the individual worker some rights which were blotted out under the Wagner Act, just as it does to management and the public.

A fair examination of the new law's provisions will show that they spring from one dominating purpose: i.e., to re-establish equality before the law.

For example, under the Wagner Act union leaders were free to say whatever they pleased about the employer to his employees. The employer, on the other hand, was denied freedom of speech in talking to his own employees. Now freedom of speech is largely restored.

Under the Wagner Act the employer was compelled to bargain with a certified union. Now the union must bargain, too.

Under the Wagner Act, unions alone had the right to petition for an election to determine whether the petitioning union represented a majority of the workers. Now the employer also has the right to secure an election.

These are features of the new Labor law that management must help workers understand. They must understand why the Act is not the "diabolical monstrosity" Philip Murray tells them it is.

Some companies have already started to explain these things to their workers. Techniques are well established, and they are techniques that any company can use. They include labor law digests in language workers can understand, supervisory conferences to cover points in the Act that affects the supervisor's handling of his job, distribution of reprinted articles that point out how employees benefit from the new law, editorials in plant newspapers and magazines, and advertisements in local newspapers.

II.

Management should take the lead whenever amendments to the Taft-Hartley law become necessary.

For twelve years labor leaders wilfully opposed every attempt to correct obvious abuses in the Wagner Act. We have now proved that a labor law *can* be amended. Let us be sure that management does not resort to the same obstructionist tactics labor has always used.

In carrying out its basic purpose to re-establish equality before the law, the Taft-Hartley Act makes it "unlawful . . . for any corporation whatever or any labor organization to make a contribution or expenditure in connection with" national elections. Corporations have long been so restrained. The novelty is the balancing restraint upon unions, which now have huge financial resources amounting to very many millions of dollars. However, the language of the Act *may* restrain the labor press from saying what it thinks about candidates, thus impinging upon the freedom of the press. Senator Taft has recognized this possibility.

If it should develop that the Act inadvertently throttles freedom of the press—or misfires otherwise—management should take the lead in securing suitable amendments to the Act. By assuming a completely stiff-necked attitude toward any and all changes in the Wagner Act, no matter how badly needed, the dominant labor leaders and their political outriders finally brought on the sweeping revisions provided by the Taft-Hartley Act. Management must not follow that example of stupid leadership.

III.

Management will be wise if it uses the new law gently in settling labor disputes.

So far employers show no disposition to use the law excessively. That is good. An analysis of the NLRB's docket from August 22 to September 30 shows that approximately 90 percent of the cases now before the Board were filed by unions and employees—not by employers.

We have been surveying employers, asking if they will have occasion to use their right to sue their unions. The answer so far is consistently, *"no."* That answer frequently is accompanied by this remark, "We certainly hope not. We have no desire to conduct our labor relations in the courthouse."

The desired result should be for the Act to produce only those law suits that are matters of vital principle. As many employers have remarked, the courthouse remains the worst possible place to conduct labor relations. The best place is in the plant—by free collective bargaining between parties enjoying an equality before the law. The Taft-Hartley law will serve its most constructive role if it encourages this kind of collective bargaining.

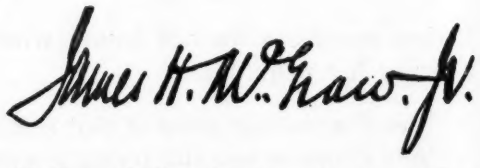
IV.

Employers should not bargain away legal rights accorded to them by the Taft-Hartley Act.

By bargaining away rights given them in that Act, employers serve only to upset a carefully created balance of equality before the law which is an essential element of fair collective bargaining.

Also, by bargaining away rights properly accorded to them, they let down those members of Congress who, in voting for the Act, braved continuous threats of political assassination by powerful union leaders. For their statesmanship in the complicated field covered by the Taft-Hartley Act these Congressmen deserve the support and gratitude of the whole nation—of management, of labor, and of the public alike.

Fairly handled on all sides, the corrective force of the Act can be made a major bulwark of industrial freedom.



President, McGraw-Hill Publishing Company, Inc.

THIS IS THE 62ND OF A SERIES

POLITICAL ACTION—
Labor's Blind Alley

THE approach of the 1948 elections brings organized labor in America to a fork in the road.

Straight ahead lies the familiar route of free collective bargaining. Except for an occasional side trip, labor has been traveling it for years. On this road the role of government is to act as traffic cop, removing obstructions for all travelers.

The fork is the road of political action—the road to special privilege for labor. On it government is called upon to clear a special right of way for organized labor—to push aside all others.

Which of these two roads will organized labor take?

Most American labor leaders are now urging their followers toward political action. Their first objective is to "get" all members of Congress who voted for the Taft-Hartley Act. AFL plans to raise a $5 million political combat fund through contributions and a per capita tax on its membership. CIO is soliciting $1 donations for political action from its 6,000,000 members.

For their own sake, however, as well as for the welfare of the country as a whole, the rank and file of organized labor will do well to stop, look and listen before they turn their unions into political action squads. If they examine the facts for themselves, they will make two significant discoveries:

I. Political action is a blind alley for labor.

II. The Taft-Hartley Act is an essential bulwark of free collective bargaining.

A brief discussion of these two statements will show what they mean to organized labor.

I

Political action is a blind alley for labor.

If there is any doubt about that statement, a good way to dispel the doubt is to look at European countries where organized labor has been following a political action line.

Britain, where the Labor Party is in power, is such a country. How is labor faring there? Measured by the good things money buys, the average hourly wage in Britain is less than two-thirds of what it is in the United States. Part of the difference may be accounted for by the fact that the British Isles are poorer in natural resources than the United States. Another reason is the war damage to Britain's plants.

But there are two other big reasons why the British wage earner is far behind the American worker in enjoying the good things of life:

1. The *incentive to produce* has been dulled by vote-catching programs which promise economic security and a levelling of incomes. Lulled by promises of cradle-to-the-grave security and discouraged by high taxes, the British have descended to a state neatly described by the London *Economist:*

"Nobody gains anything from activity or suffers anything from inactivity."

2. To run a program like Britain's requires more and more government functionaries. Civilian employees of the British government have increased by 50% since before the war, putting one worker out of ten on the government payroll. More and more people stop producing and spend their time instead cutting up what others produce. The result is smaller production, higher taxes and lower real wages.

The British Labor Party must accept most of the responsibility for this sorry state of affairs. It is due primarily to a program of political action by organized labor which promised the individual worker security and equality of income—*but which can not deliver either because the incentive to work is gone.*

The lesson for American wage earners is clear. Political action by unions to enforce the economic fallacy of more-and-more-for-less-and-less will end by impoverishing the working man—and bringing the nation to ruin.

Unions exist for collective bargaining, not for politicking.

II

The Taft-Hartley Act is an essential bulwark of free collective bargaining.

Bargaining works satisfactorily only when both parties—management and labor—think they are getting a fairly even break.

Management was very sure that the Wagner Act, as administered from 1935 to 1947, was giving employers the short end of the stick. Furthermore, management's feeling of frustration was no whim. It was justified by case after case where rights were granted to organized labor with no counterbalancing recognition of the rights of management, of individual workers or of the public.

The Taft-Hartley Act goes a long way toward establishing equality in employer-union relations. It may fall short of doing a perfect job. *As a subsequent editorial in this series will show, it leaves virtually untouched the public menace of industry-wide bargaining and labor monopoly. And it leaves unprotected what should be the individual's right to hold a job without joining any particular organization.* But it *does* provide some major safeguards for collective bargaining by striking at abuses.

Organized labor, therefore, has no cause to damn the members of Congress who voted for the Taft-Hartley Act. True, the law will check what has been an uninterrupted march of the labor union bosses toward absolute power. It will do so just as laws in the past—The Sherman Anti-Trust Act, for example—have checked management when it was too greedy. And, as the first section of this editorial points out, the time has come to check the march of the big labor bosses.

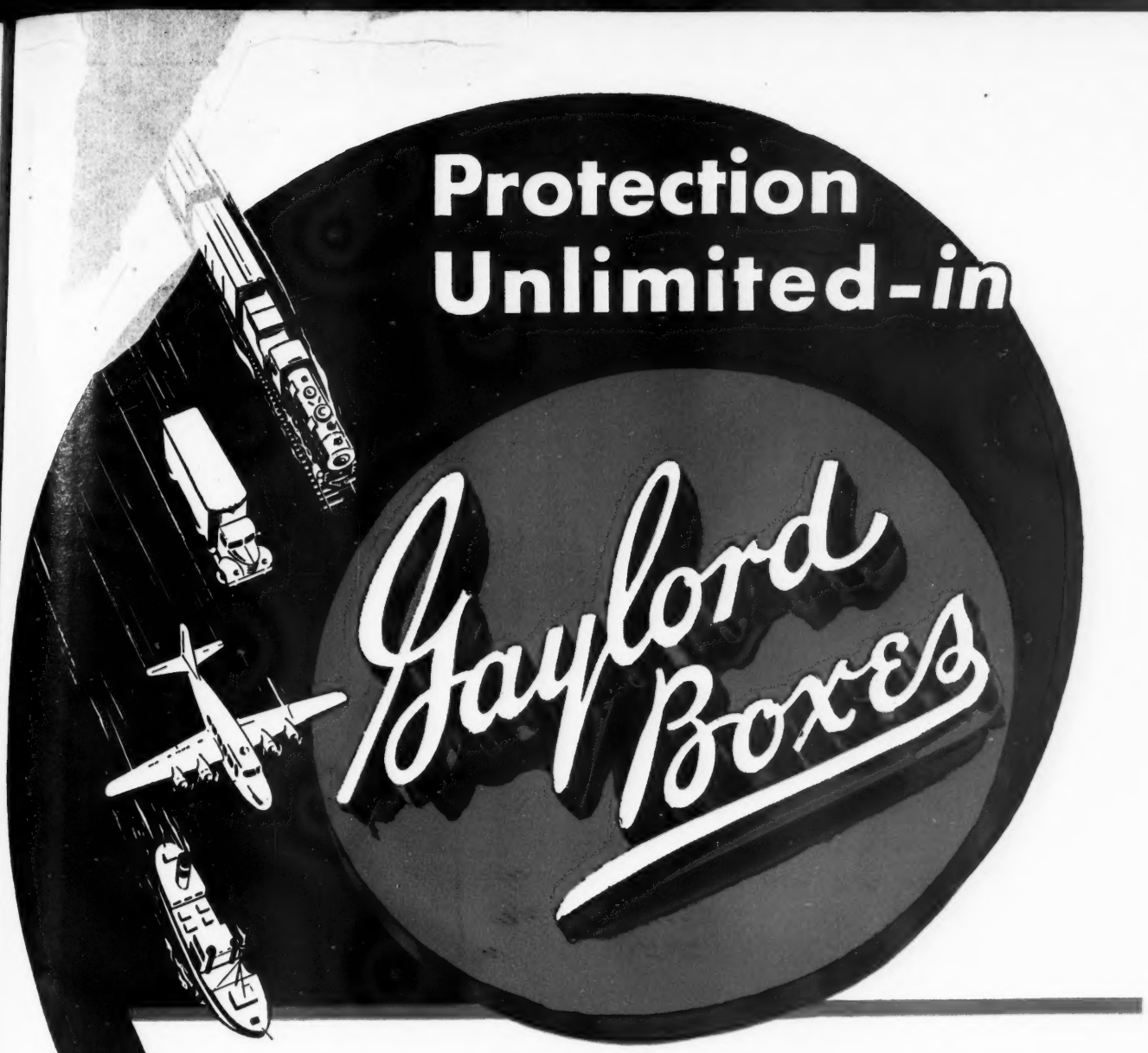
Fundamentally, the Taft-Hartley Act gives free collective bargaining a new lease on life. The old lease was running out because the Wagner Act stacked the cards against employers, against individual workers, and against the public.

The road to free collective bargaining is now clear of many of the most menacing obstructions. It is the only road for labor to take in its own self interest. Union workers who let their leaders lure them down the blind alley of political action will do so at their own peril—and at the peril of this great industrial nation.

James H. McGraw, Jr.

President, McGraw-Hill Publishing Company, Inc.

THIS IS THE 63rd OF A SERIES



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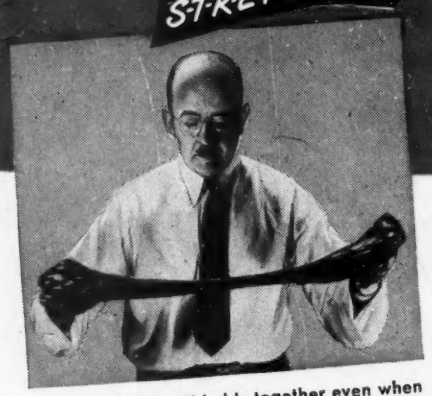

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